Academic socialisation in the fields of engineering and the social sciences/humanities : a case of Iranian PhD students in the UK

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ACADEMIC SOCIALISATION IN THE FIELDS OF ENGINEERING AND THE SOCIAL SCIENCES/HUMANITIES: A CASE OF IRANIAN PHD STUDENTS IN THE UK

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THESIS SUBMITTED FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

2003

DEPARTMENT OF EDUCATION AND PROFESSIONAL STUDIES

SCHOOL OF SOCIAL SCIENCES AND PUBLIC POLICY

KING'S COLLEGE LONDON

ABSTRACT

In order to study the informal routes through which engineering and social sciences/humanities PhD students learn the craft of doing research in their fields, interviews were conducted with 13 Iranian PhD students in engineering and social sciences/humanities in the UK, and 6 of their supervisors. Taking a constructivist grounded theory framework (Charmaz 2000) and using QSR.NUDIST to analyse the data, the findings show that although there has been a lot of emphasis on the formal ways of learning in PhD education in the UK, PhD students go beyond this formal learning and develop many of their social practices through informal interactions with their supervisors and student peers. It is argued that the theory of 'communities of practice' (Wenger 1998), and the concepts of 'legitimate peripheral participation' (Lave and Wenger 1991) and 'scaffolding' (Wood *et al.* 1976) are important tools to explain these informal ways of learning in PhD education. It was also found that Wenger's (1998) concept of 'communities of practice', although providing a theoretical framework for looking at learning in PhD education, does not capture all aspects of the academic socialisation of these students. Based on analysis of its limitations in the light of the research data collected for this thesis, a new formulation for 'dimensions of practice' is presented in an attempt to overcome the shortcomings of the original model by Wenger (1998) and develop its application to PhD students.

Acknowledgement

I would like to thank all those who made this study possible. I specially thank the students and supervisors who agreed to be interviewed. I would also like to thank all my teachers from Hosein-ali Gooya Primary school in my hometown, Kermanshah, to the colleagues at the Department of Education, King's College London. And last but not least, my special thanks go to my supervisors Professor Brian Street and Professor Peter Skehan, who not only provided me with a great deal of support and encouragement, but also taught me how to care for my own students.

To my father

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CHAPTER ONE

INTRODUCTION

1. 1. Introduction

I believe the first chapter of every thesis, often labelled **Introduction**, is in fact the "story" of that research. It is an account of the problems that made the researcher start probing into the issues of the study, the context and situation in which the study unfolded, the practical problems the researcher encountered in handling the study, and probably the new perspectives the research has created for doing further investigations. This first chapter of a PhD thesis is, I believe, even more than that: it is an account of the researcher themselves. It tells the story of the research from the point of view of the researcher, the way the researcher has been effective in the study, and the way they have been affected by the study. In other words, it is also the story of the interaction between the researcher and the research study. Looking at the **Introduction** chapter of theses in this way makes it unnecessary trying to take the researcher out of the thesis. This chapter is written with all the objectives outlined so far, and above all, it tells the story of my research. I should also emphasise that I, as a PhD student, have been influenced to a great extent by both my supervisors, Professor Brian Street and Professor Peter Skehan on different aspects of my study from topic selection and data collection, to data analysis and writing. Therefore, I am myself suspicious of my use of the term 'I' all through this thesis. This is because I am indebted to them for many of the ideas presented in this thesis, and I would use 'We' were I allowed to do that. Alas I am bound by the 'generic' (Bhatia, 1997) rules of thesis writing. However, I should once again emphasise the great impact they have

had on me, as a would-be academic, and on this manuscript. I will start by the way my topic of research developed below.

1.2. My Topic of Research

Having completed an MA in Teaching English as a Foreign Language, I started my PhD on a very broad topic—the role of cultural background on the writing problems of my fellow countrymen doing PhDs in the UK. My overall framework at that time was contrastive rhetoric (Kaplan 1966, 1987; Connor 1987; Grabe and Kaplan 1996; Ramanathan 1996, 2000). My hypothesis was that Iranian students studying in the UK had particular problems because of the influence of their cultural background on the way they organised their writing. The solution, I anticipated, would be to make different rhetorical variations explicit to these students and empower them to cope with their possible problems in academic writing. Another theoretical framework I was interested in was looking at academic writing within an academic literacies perspective (Lea and Street 1998), the basic idea of which is to look into the contested nature of academic writing between students and tutors.

In order to start my research, I had to locate some of the Iranian students I wanted to study. In addition, I wanted to find what particular type of writing was characteristic in their studies. This was important because I wanted to make sure that I would choose the most common type of writing activity in my study. As it happened, there was a Nowrooz Celebration, the Iranian New Year, being held in a holiday resort in Prestatyn, North Wales. I decided to take my chances and start collecting my data there. I will discuss this in detail in *Chapter 3*, but I just want to say that I noticed something that turned out to be more interesting than the initial contrastive rhetoric

theoretical framework. I encountered some students whose supervisors had assigned their PhD topics to them and others who in contrast had selected their PhD topics themselves. What was more interesting was that the distribution of these students did not seem to be random. The assigned students were mostly from engineering and science-based fields while the non-assigned students were mostly from the social science/humanities fields.

When I came back from Prestatyn, I wrote a report to my supervisors describing my data. As I was not really sure if my new finding of assigned versus non-assigned students was really important, I referred to it briefly someway towards the end of the report. This, however, was noticed by Professor Skehan and further developed by Professor Street by bringing into the picture the issue of different epistemologies in different fields of study.

This finding changed my research dramatically. I started asking particular questions about the nature of topic assignment and more general questions on the nature of academic socialisation into different academic disciplines. At the same time I was reading *Communities of Practice* by Wenger (1998), *Situated Learning* by Lave and Wenger (1991), *Genre Analysis: English in Academic and Research Settings* by Swales (1990), and *Social Linguistics and Literacies* by Gee (1996). The reading of these 'social turn movement' (Gee 2000) theories and my finding in Prestatyn regarding the different ways PhD students are initiated into their 'discourse communities' (Swales 1990), made me think of making a shift in the focus of my study. I decided to look into the process of *academic socialisation of PhD students*.

1.3. Methodology

As I have already pointed out, I started my study by going out into the field and collecting data within a contrastive rhetoric framework. The assignment of topics I observed among students from different disciplines was something I had neither anticipated nor knew of, but I decided to investigate it. All these factors led me to do more interviews with some of the students I had interviewed in the first phase of my study. This time, however, I went to their supervisors as well. While I was doing more interviews, I analysed the data I was gathering and refined my initial research questions. Then I found myself engaging in a methodological framework which has been referred to as a branch of ethnography (Hammersley 1992): I was doing grounded theory. After reading more in this area, I came across a version of this methodological framework that I found to be more or less congruent with what I believed, or was starting to believe, about the nature of research and knowledge. I read an article by Charmaz (2000) on the constructivist version of grounded theory. This made things a bit clearer for me and I could work out my epistemological standpoint. I sided myself with an interpretivist epistemology. I will discuss in detail my own understanding of interpretivism in *Chapter 4*, but I would like to briefly mention that my belief in interpretivism does not rule out my belief in being systematic in doing research.

At this point, I will bring in the questions I have been following in this research with the aim of demonstrating the constructivist grounded theory procedure of my research.

1.4. Research Questions

Before any data collection, I had the following questions in mind to probe into:

1. To investigate particular problems that academic writing in English creates for Iranian PhD students in London;
2. To explore the extent to which these problems relate to:
   a. linguistic differences between Farsi and English; e.g., discourse features, coherence, cohesion, rhetorical features etc.;
   b. differences between tutors and students in their perceptions of what constitutes academic writing;
   c. differences between disciplines as they affect these subjects with particular reference to discourse features.
3. To find out what contributions this study makes to understanding of variations in discourse patterns of academic writing across cultures.

After doing mini interviews with 42 Iranian PhD students, I decided that the following questions were worth investigating more than the initial research questions, one reason being that they had emerged from the data:

1. How are these students socialised into their respective research communities?
2. How do they understand the norms and expectations in their disciplines?
3. How do they acquire the *Discourses* followed in their *discourse communities*?

The above questions were more important because, I would argue, they situate the problems PhD students might have at a deeper level than traditional contrastive

linguistic studies. This is not to deny the importance of such studies, but I believe that looking at the issue from the perspective I am taking can clarify many of the issues that have gone unnoticed in contrastive studies.

After interviewing some students, I came to know some of the 'core variables' (Glaser and Strauss 1967) of the study, such as *funding*, *assignment*, and *working together* among others. In order to further my understanding of these issues, I decided to look at them from the point of view of the supervisors as well. I will elaborate on these in *Chapter 3* and *4*, but I hope this brief account has shown, to some extent, the *grounded* nature of my enquiry.

1.5. Participants

In the initial phase of the study, I did mini interviews with 42 Iranian PhD students studying in four different fields: engineering, science, medicine, and the social science/humanities. As I have already explained, in the later phases of the study I did more in-depth interviews with 13 of these students. However, I decided to leave out medical and science students from my study and focus on engineering and social science/humanities students. Five of these students were in the social science/humanities fields of study and 8 of them were studying engineering. I also interviewed some of the supervisors of the same students I had already interviewed: two in the field of social science/humanities and four in the field of engineering. I will provide a full account of the interviews in *Chapter 3* (Methodology).

In the present chapter I would like to refer to two important points regarding the participants in this study. The first point is that for reasons of confidentiality I will use

pseudonyms to refer to the participants and settings. I will use common Iranian names to refer to the students under study. To refer to the engineering supervisors, I will use Dr.e(*n*), where *n* shows the order in which I interviewed the supervisor in question. This means that I will refer to the four engineering supervisors as Dr.e1, Dr.e2, Dr.e3, and Dr.e4. I have used a similar coding system to refer to the two social science/humanities supervisors: Dr.h1 and Dr.h2. The numbers do not have any significance other than the order in which these supervisors were interviewed in each field. I will also use pseudonyms to refer to the names of the universities in which the participants worked.

The other important issue that should be tackled at the outset is the question of the nationality of the students under study. One might very well ask, why Iranians? The importance of this question is highlighted in the context of my argument for the academic socialisation of PhD students in general rather than a specific group of PhD students. My answer to this question is that, as I have already made clear, my main concern at the start of the study was a contrastive rhetoric study to probe into the difficulties of Iranian students in academic writing. However, as I was working within the framework of grounded theory, the data itself had a strong impact upon my research in general and the topic of the study in particular. In fact, it took quite a long time, maybe more than a year, for the topic to become established, if this is a correct way of putting it. By the time I had come to understand the 'core variables' in the study, I had already collected a lot of data that seemed to be sufficient to clarify my arguments, and I did not have the time and resources to go to other groups of PhD students to collect more data within the scope of a three-year project. In other words, my initial research questions dictated the nature of the subjects under study, and as I

collected more data and the questions were modified in the light of new findings, it was very difficult if not impossible, to reflect that change in the nature of subjects. However, I have to live with the limitations of this situation. I cannot and do not claim generalisability of the outcomes of this study, though there seems to be no reason that the Iranian PhD students in this study were not typical with regards to the issues I raise in this thesis.

1.6. Contribution to Knowledge

1.6.1. Theoretical Contribution

One of the important aspects of any research study at the level of PhD, I believe, is the actual contribution to knowledge that the research study has made. In this section of the present chapter I will explain the rationale behind this study, or in other words the 'so what' question. I argue that the present study has made both practical and theoretical contributions.

The practical contribution that this study has been able to make, at least, is that of providing a new framework for looking into the ways of learning at the PhD level. The recent emphasis on a research training component in the UK higher education reflects the ideology prevalent in UK higher education of the way PhD students learn how to do research. In the present thesis, as I will show through the different chapters, there are 'hidden' dimensions of learning that have usually gone unnoticed. I have categorised these hidden aspects of learning at the PhD level in terms of the framework of the theory of communities of practice (Lave and Wenger 1991; Wenger 1998).

The theoretical contribution of this study has been the result of a comparative analysis of my ethnographic data with the theory of communities of practice. I have argued in various chapters of this thesis, and specifically in *Chapter 8*, that the model for dimensions of practice presented by Wenger (1998) suffers from two types of shortcomings: first, the relation among different components of the model has not been made clear, thus the model lacks internal validity. Second, the data I have collected do not seem to be totally congruent with the model, and so, it also lacks external validity. I have provided a revised model of dimensions of practice (Wenger 1998) in *Chapter 8*. The models and diagrams that I will present in *Chapter 8*, however, should not be taken as 'the absolute truth'. These are only heuristics to represent my understanding of the contexts under my study.

One important point to bear in mind, however, is that the theory of communities of practice presented by Wenger (1998) incorporates both theories of identity and theories of practice. My concern in this thesis will be with the theories of practice.

1.6.2. Methodological Contribution

In addition to the theoretical contributions outlined above, I will present a methodological contribution in *Chapter 4*. The main concept of this would be the relationship between grounded theory, unit of analysis, and writing a thesis. I will present my own experience of tackling the issue of unit of analysis for my own thesis and argue that this would be a possible way of using grounded theory to do research.

1.7. The Structure of the Thesis

I hope I have paved the way for the main arguments of this thesis that will be brought in later chapters. In this final section of the present chapter, I would like to briefly mention the structure of the thesis and give a brief account of each of the chapters.

In *Chapter 2*, *A Review of Related Research and Literature*, I will look at the theories that have influenced me during the course of my PhD. I will specifically look at the theory of communities of practice (Lave and Wenger 1991; Wenger 1998) and discourse communities (Bizzell 1982, Swales 1990, Berkenkotter and Huckin 1995). I will also refer to some previous related research studies. This, however, does not rule out my use of the literature in the succeeding chapters. I will refer to related literature and research in *Chapters 4, 5, 6, 7* and *8* to support my arguments.

Chapter 3, *A Preliminary Look at the Data*, is a first look at the data that has formed the arguments in this study. The data often look messy and can at most be considered as descriptive accounts of the interviews I have done. I have presented this chapter in this particular way deliberately to reflect the grounded nature of the study.

In *Chapter 4*, I will describe my methodological framework. I will recount the way I used grounded theory, ethnographic tools, and NUDIST to do my research.

Chapter 5, *Research Students as Communities of Practice*, will be the first of three data based chapters. In this chapter I will refer to my data on the PhD students under study within the framework of the theory of communities of practice. I will explore the extent to which the PhD students in the two fields I have studied, namely

engineering and the social science/ humanities, can be regarded as communities of practice. I would argue that looking at PhD students in this framework would help us understand many of the hidden aspects through which PhD students learn the craft of doing research.

My second data based chapter, *Chapter 6: PhD Students and Their Supervisors*, explores another aspect of learning in doing a PhD. This chapter will specifically look at the scaffolding role of supervisors vis-à-vis PhD students. I will use the concept of LPP (legitimate peripheral participation) to look at this issue.

In *Chapter 7*: *Topic Assignment in Discourse Communities*, I look at one of the differences between the ways in which PhD students in the two fields of engineering and social science/humanities are initiated into research. I introduce another framework, namely the concept of discourse communities, to look at PhD students and their supervisors and will investigate the ways PhD topics are agreed upon in engineering and the social science/humanities.

Chapter 8, is an attempt to put together my findings in the study and ideas presented in previous chapters to present a coherent picture of the academic socialisation of PhD students. In this chapter I will argue that the theory of communities of practice as explained by Wenger (1998) suffers from certain shortcomings, and I will present a modified model of dimensions of practice. I will then look at the relationship between the theory of communities of practice (Wenger 1998) and the theory of discourse communities (Swales 1990; Beaufort 1997).

In *Chapter 9*, I will revisit the research questions of the study and evaluate the extent to which I have managed to answer them. I will also present some ideas on how this research can be extended.

Tell me and I forget
Teach me and I remember
Involve me and I learn

Benjamin Franklin

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

My purpose in writing this chapter is twofold: a) to provide an overview of the theoretical frameworks related to my work, and b) to give an account of previous research studies conducted in this area. These will help to contextualise my research and will also pave the way for the arguments in the succeeding chapters. These two purposes are directly related to my main aim in this research, which has been to probe into some aspects of the academic socialisation of PhD students in the two fields of engineering and social sciences/humanities. As I have worked within the framework of grounded theory, it might seem contradictory to present a set of theories as shaping part of my account of my endeavour to look into the academic socialisation of PhD students. This is because, although I have adhered to the tenets of grounded theory, I align myself with a constructivist (Charmaz 2000; Schwandt 2000) version of this theory. This means that I take it for granted that my findings are the result of the interaction between me, as a researcher, and the data, rather than solely emerging from the data. I will discuss these ideas in more detail in *Chapter Four*, but I find it necessary to refer to these here to justify my account of the theories related to my study. I should further add that my account of related theories and research in this chapter does not mean that I will not be referring to these in the following chapters. Quite the reverse, I will present my data based chapters using and referring to these

theories to pursue my arguments. In the following paragraphs, I will set myself the task of contextualising the present research.

There has been a great deal of research into the difficulties native or non-native research students face with their studies in general, and with academic writing in particular. Two main trends have particularly investigated academic writing. On one side, researchers in the academic literacies discipline have been investigating assumptions of tutors and students regarding what constitute 'good' academic writing, and the institutionalised rules that govern and affect academic writing (Lea & Street 1998; Lea 1998). From another perspective scholars in ESP and EAP have focussed on different rhetorical patterns in different languages and different disciplines to find a solution to the poor performance of NNS (non-native speaker) students (Kaplan, 1966; Connor, 1987; 1999; Eggington 1987; Grabe 1987). It is therefore no surprise that these two are linked. Turner (2000), on the relationship between *academic literacies* and *EAP* writes:

> The term academic literacy reveals its derivation from literacy studies and has already started to make its voice heard in that tradition as an area of literacy practice among others .... It shares with EAP in the Teaching English as a Foreign Language tradition, notions of 'study skills' and culturally preparing potential students for, or supporting existing students in, higher education. While the focus in the literacy tradition tends to be on the student's experience, the focus in the EAP tradition is more on the rhetorical structuring of texts and facilitating students reading and writing within such preferred structures (p. 150).

Nevertheless, there seems to be little research into the ways different students are *socialised into*, or absorbed by their research communities. I argue that we can better understand this process if we study the following three issues:

1. How these students are initiated into their respective research communities,
2. How they understand the norms and expectations in their disciplines,
3. How they acquire the *Discourses* followed in their *discourse communities*.

I believe any study in this area will be worthwhile, since a better understanding of the current state of affairs will help find better solutions for a range of problems faced by these students, one being their academic writing practices. In fact, I consider doing a PhD as itself a socialisation process by means of which novice PhD students learn the norms and expectations of their academic communities. Academic writing is one of the crafts that PhD students should acquire in their overall process of socialisation. However, as I will argue later in this chapter, academic writing is also one of the ways through which PhD students get to acquire the norms and expectations of their academic communities and be socialised into them.

I contextualise this research in the broader framework of the 'social turn movement'. According to Gee (2000), this movement's emphasis on the 'social' nature of the 'individual' was a reaction against too much emphasis on the 'individual' in behaviourism and later in cognitivism:

> Over the last several decades, in and across a wide variety of disciplines, there has been a massive 'social turn' away from a focus on individual behaviour (e.g., the behaviourism of the first half of the twentieth century) and individual minds (e.g., the cognitivism of the middle part of the century) toward a focus on social and cultural interactions (Gee 2000, p. 180).

He then lists fourteen such movements. I will make use of three of these in this chapter in order to understand the above problems. These are *communities of practice (situated learning)* (Lave and Wenger 1991, Wenger 1998), *Capital D and small d discourses* (Gee 1996; 1999), and *discourse communities* (Swales 1990; Beaufort

1997). The main theory I will be dealing with will be the theory of *communities of practice* (Wenger 1998). I will frame PhD students in my study as communities of practice. I will also argue that discourse communities are specific types of communities of practice for which writing is of paramount importance. In order to understand these two theories, I will have to discuss the concept of D/discourses (Gee 1996) as well. I start by an account of the theory of communities of practice.

2.2. Communities of Practice

It seems worthwhile to start my discussion of the theory of communities of practice (Wenger 1998) by elaborating on situated learning, which is an endeavour to account for learning from a social point of view. The focal point in this theory is the concept of 'legitimate peripheral participation' (Lave and Wenger 1991). According to this theory, newcomers learn the craft of their masters by being led into the profession little by little, hence the concept of the 'periphery'.

Lave and Wenger (1991) mention "lessened intensity, lessened risk, special assistance, lessened cost of error, close supervision, or lessened production process" (p. 100) as the ways in which *periphery* can be achieved, and "being useful, being sponsored, being feared, being the right kind of person, and having the right birth" as forms that *legitimacy* can take (p. 101). They further argue that:

> Legitimate peripheral participation provides a way to speak about the relations between newcomers and old-timers, and about activities, identities, artefacts, and communities of knowledge and practice. It concerns the process by which newcomers become part of a community of practice (p.29).

By community of practice, they mean "a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of

practice" (p.98). They further argue that participation in a community of practice is an essential and "epistemological" principle of learning. In other words, if one wants to acquire the practices of a community, one should participate in the activities and the theories of knowledge of that community. This emphasis on 'participation' suggests the situated nature of learning. It will be seen in *Chapter Six* that engineering supervisors in my study often deliberately involved their students in tasks that were not demanding in nature in order to initiate them into research. These can be taken as instances of legitimate peripheral participation.

The idea of legitimate peripheral participation can be regarded as a modification of the cognitive apprenticeship model. Belcher (1994) compared the cognitive apprenticeship model proposed by Brown, Collins, and Duguid (1989), with the concept of situated learning proposed by Lave and Wenger (1991). She quotes Brown *et al* on the steps of the cognitive apprenticeship model:

> the mentors (1) 'model,' by making their tacit knowledge explicit and revealing the problem-solving strategies; (2) 'coach,' by supporting students' attempts to perform new tasks; and then (3) 'fade,' after having empowered the students to work independently (Brown et al 1989, p. 39; in Belcher 1994).

Belcher (1994), however, mentions, as the shortcomings of this approach, (a) different abilities of mentors, (b) scant attention to the research community, and (c) looking upon the learner as a passive recipient. She approves of Lave and Wenger's (1991) refinement of the cognitive apprenticeship model, "legitimate peripheral participation" or "situated learning". She writes that this theory "equates learning with increasingly greater involvement in a sociocultural community" (p. 23).

The roots of the concept of Legitimate Peripheral Participation probably go back to Vygotsky's (1978) concept of the Zone of Proximal Development. The focal point in this concept was the difference between what children can do alone and what they can do by assistance from adults or more capable peers (Wood & Wood 1996).

The concept of ZPD was later translated into more concrete metaphors, such as 'apprenticeship' (Rogoff and Lave 1984; Duveen 1997), and 'scaffolding' (Wood *et al.* 1976). As Wood & Wood (1996) state, "the formulation of [the metaphor of scaffolding] was designed to explore the nature of the support that an adult provides in helping a child to learn how to perform a task that, alone, the child could not master" (p. 5). This idea has also been extended to contexts where older learners are considered (Beaufort 2000, p. 189).

The following diagram adapted from a similar diagram by Colwell, to some degree clarifies the concept of LPP.

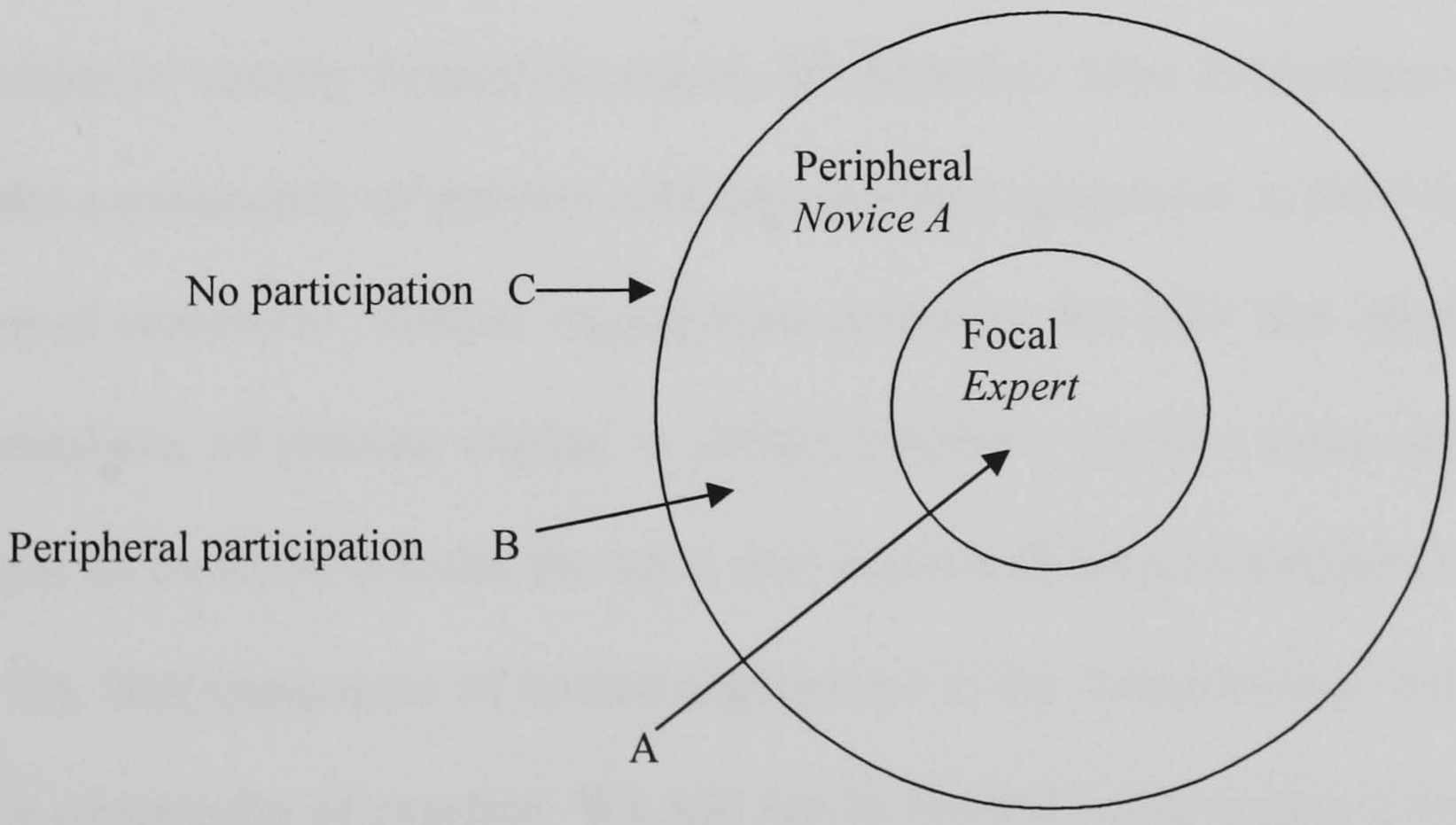

FIGURE 2.1: Legitimate Peripheral Participation
(Adapted from a similar diagram by Colwell 1999)

The concept of LPP (legitimate peripheral participation) has been used in a number of studies since it was first introduced by Lave and Wenger (1991). Beaufort (2000) conducted a yearlong ethnographic case study to investigate the ways in which two newcomers (novice writers) in an agency developed into experts. The agency provided ESL courses and job skills training. The subjects in this study, who were both university graduates, often engaged with the specific writing practices of the agency. The researcher found that the LPP (legitimate peripheral participation) model proposed by Lave and Wenger (1991) was applicable in this study. Beaufort writes:

> the situation observed in this particular non-profit organisation exhibited all of the features of Lave and Wenger's (1991) framework for legitimate peripheral participation (LPP): the goal of learning was to take action, rather than knowledge for knowledge's sake; learning was embedded in a system of relationships, and the learner had an opportunity to observe the entire enterprise; learning was contextualised and situation specific rather than abstract, and membership in the community of practice was conferred from the outset rather than learning being a condition for membership (p. 214).

The idea of communities of practice was expanded and elaborated on later by Wenger (1998). He proposed a social theory of learning in which theories of practice and theories of identity formed the nuclei. He identified three dimensions of practice that make a community of practice coherent: *mutual engagement, a joint enterprise, and a shared repertoire*. Mutual engagement points to the idea that participants in any community of practice engage in certain practices: "in this sense, practice does not reside in books or in tools, though it may involve all sorts of artefacts" (Wenger 1998, p. 73). One component of mutual engagement is the 'relationships' between members of a community of practice. We will see in the following chapters that this could be quite varied: one interviewee will refer to a supervisor as a 'father', while another interviewee seems to be completely dissatisfied with his supervisor.

Wenger (1998) argues that members of a community of practice may have different objectives in joining the community of practice, but they form relationships in order to do their duties through mutual engagement. The following diagram by Wenger (1998) shows the relationship between the three dimensions of practice:

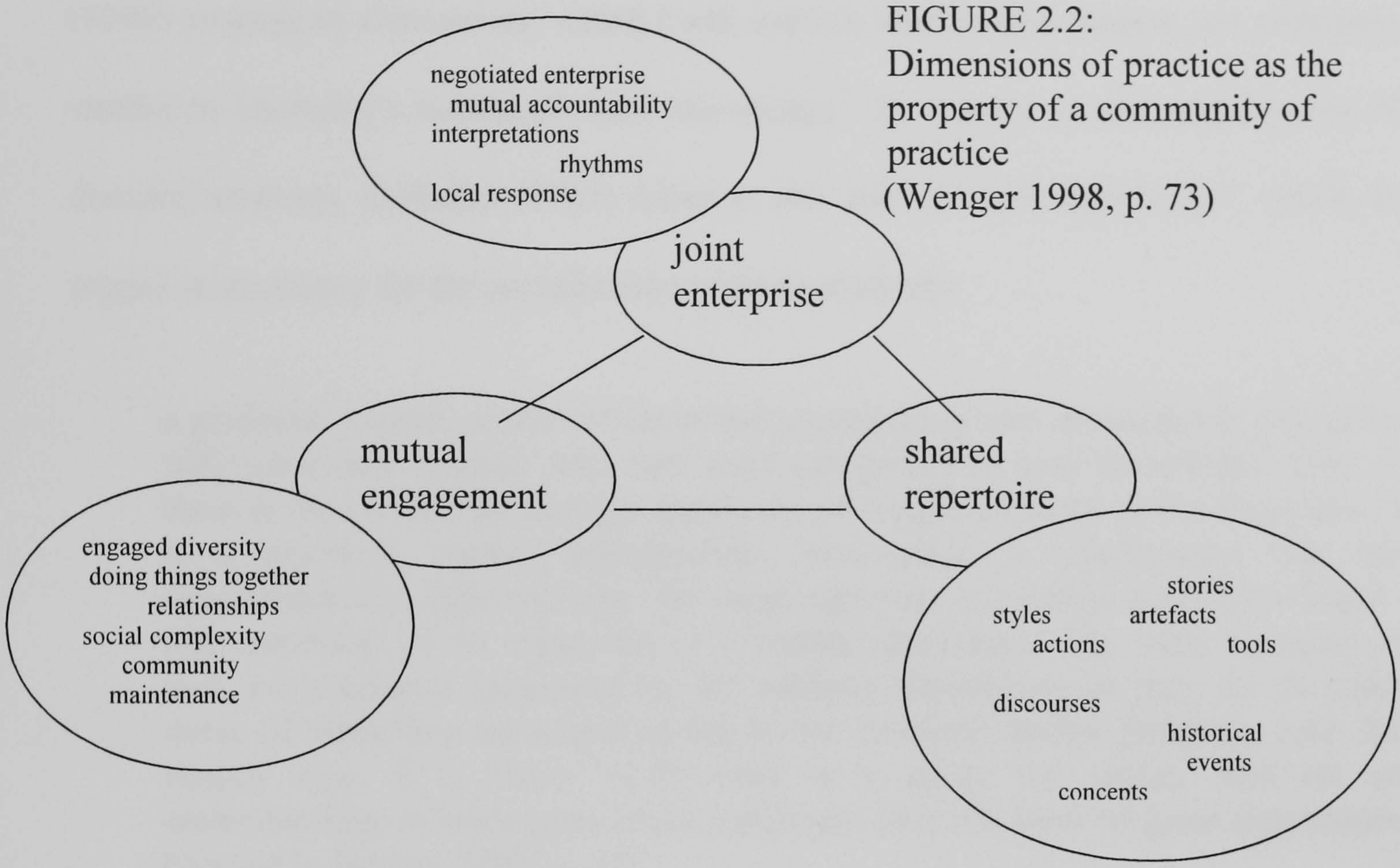

FIGURE 2.2:
Dimensions of practice as the property of a community of practice
(Wenger 1998, p. 73)

Joint enterprise refers to the relative similarity of purposes and objectives among members of a community of practice. Wenger (1998) writes that the enterprises followed by the members of a community of practice are complex and they include instrumental, personal and interpersonal aspects (p.78). Members often join a community for personal reasons, such as earning a living, but they engage in mutual relationships to maintain their community and carry on with their practice.

A 'shared repertoire' means that through time a community of practice collects a set of concepts and artefacts, among other things, for the negotiation of meaning among its members:

> The repertoire of a community of practice includes routines, words, tools, ways of doing things, stories, gestures, symbols, genres, actions, or concepts that the community has produced or adopted in the course of its existence, and which have become part of its practice (p. 83).

Both Wenger's (1998) concept of *a shared repertoire*, explained above, and Gee's (1996) concept of *Discourses*, which I will explain later in this chapter, are strikingly similar to Gerholm's notion of 'tacit knowledge'. In a study on the socialisation of doctoral students, Gerholm (1985) refers to this sort of 'tacit knowledge', which he argues is necessary for the socialisation of these students:

> a graduate student, as part of his or her socialisation into an academic discipline will come into contact with two main categories of tacit knowledge. One of them is the knowledge that has grown out of long experience in the discipline. It is a practical, almost subconscious, knowledge or competence that the department elite fully masters. The most important ingredient is the knowledge and command of the repertoire of scientific discourses. The other category of tacit knowledge is generated by the students themselves as they try to make sense of what they are experiencing in the graduate studies program, Like the former type, it is likely to be used as a guide for action. And for an understanding of what goes on in Academia they are both of great importance (quoted in Becher 1989, p. 26).

The similarity among the concepts of 'a shared repertoire', 'Discourse', and 'tacit knowledge' becomes more evident when we consider Gerholm's refererence to the 'hands-on' nature of acquiring this sort of tacit knowledge in academia:

> Any person entering a new group with the ambition of becoming a full-fledged, competent member has to learn to comply with its fundamental cultural rules. This applies also to academic departments. To function smoothly within the group of teachers, fellow students and secretaries, the student needs a considerable amount of know-how. Most of it will be acquired slowly through the interaction with others and without anyone ever making a deliberate effort to teach the newcomer the rules of the game. Nonetheless, failure to comply with these implicit rules will undoubtedly affect the student's standing within the group (quoted in Becher 1989, p. 26)

I will present a more critical view of these in *Chapter 8* and will argue that Wenger's (1998) 'shared repertoire' could be modified to make it a more powerful concept to deal with issues connected to the validity of the theory of communities of practice.

The second aspect of the theory Wenger (1998) creates is related to *identities* in communities of practice. He points out that identity in a community of practice translates into a form of competence. Members form their identities on the basis of what they know, and *not* on the basis of what they do not know:

> An identity in this sense is relating to the world as a particular mix of the familiar and the foreign, the obvious and the mysterious, the transparent and the opaque… In practice, we know who we are by what is familiar, understandable, usable, negotiable; we know who we are not by what is foreign, opaque, unwieldy, unproductive (Wenger 1998, p. 153).

This, however, seems to be, to some extent, incomplete. This is because not only do our awareness and knowledge of *what we know* influence our identities, our knowledge of *what we do not know* also seems to be forming our identity.

Wenger (1998) adds that learning cannot be separated from the practice in which one engages (p.95). He further explains that members of a community of practice do not engage in practice in order to learn something else, but "engagement in practice… is both the stage and the object, the road and the destination" (p. 95). He then argues that "practices are histories of mutual engagement, negotiation of an enterprise, and development of a shared repertoire" (p. 95). Then he defines learning in practice as consisting of the following:

> *Evolving forms of mutual engagement:* discovering how to engage, what helps and what hinders; developing mutual relationships; defining identities, establishing who is who, who is good at what, who knows what, who is easy

or hard to get along with.

Understanding and tuning their enterprise: aligning their engagement with it, and learning to become and hold each other accountable to it; struggling to define the enterprise and reconciling conflicting interpretations of what the enterprise is about.

Developing their repertoire, styles, and discourses: renegotiating the meaning of various elements; producing or adopting tools, artefacts, representations; recording and recalling events; inventing new terms and redefining or abandoning old ones; telling and retelling stories; creating and breaking routines (p.95).

As is clear from the account I have provided above, newcomers learn in interactions with other members of communities of practice. Other researchers and theoreticians have also discussed the role of interaction with peers in communities. Connor (1996) cites Casanave (1995) who argues "for considering disciplinary communities as 'intellectual villages,' which are local and interactive" (Connor 1996, p.78). Connor concludes that "discussions with peers, other professionals, and self dialogue are important when students are learning to think and write in their disciplinary communities" (1996, pp. 78-79). As we will see in the next chapter, Saeed's (one of the engineering students under study) experiments would never have been conducted without the help from other professionals and students in his section, and Bizhan (another engineering student) could easily find out 'who is good at what'. These are instances of 'mutual engagement', which are important in the overall socialisation of research students into their discourse communities.

Along a similar line, Green and Bloome refer to Yeager *et al* (in press) on their understanding of disciplines:

> Viewed from the perspective of "knowledge how," Yeager *et al.* (in press) argue that a discipline can be viewed as a community, a social and cultural group, with its own ways of acting, believing, thinking, feeling, valuing, and

> using language (cf. Goodenough's ,1981, definition of culture). Thus, as a social and cultural group, a disciplinary community can be studied in the same manner that other social and cultural groups can be studied, employing ethnography and ethnographic inquiry (Green and Bloome 1997, p. 194).

At this point, I will take up my discussion of Wenger (1998) who further argues that the process of learning is intertwined with a process of change in one's identity. He writes, "[learning] is not just an accumulation of skills and information, but a process of becoming – to become a certain person or, conversely, to avoid becoming a certain person" (p. 215). He further argues that the process of accumulation of skills and information serves in the making of members' identities.

Coleman and Simpson (1999), although not drawing on the theory of communities of practice, found a change in the identity of their students as a result of doing a course in anthropology. They studied two groups of anthropology students in a British institution of higher education, and found that the mere practice of engaging in a course of anthropology had some consequences on students. One of these was a change students felt they had gone through in their personhood. Coleman and Simpson (1999) report that "one very tangible consequence is that of empowerment: students appear to acquire more confidence and flexibility in dealing with situations" (p. 5). Borrowing the concepts of 'restricted and elaborated codes' from Bernstein (1971), they argue that one of the changes in the personhood of students was that they moved from a 'restricted code' to an 'elaborated code' in their style of discourse.

In sum, the theory of communities of practice is a 'social turn movement' (Gee 2000) theory of learning, which situates learning in the participation of newcomers in the practices of their target community. This theory is built upon two theories: theories of

participation and theories of identity. In the present research, my main concern is with the former, in which Wenger identifies, as we have seen, the three dimensions of practice: 'a joint enterprise', 'mutual engagement', and 'a shared repertoire'.

2.3. Discourses

I would like to build upon the distinction made by Gee (1996: 1999) between two types of discourses in order to use it in my arguments that will follow later in this chapter and the following chapters. Gee (1996; 1999) writes that we can think of two discourses, a discourse written with a lower case *d,* and a Discourse written with a capital *D.* The discourse with a lower case *d* is that usually discussed in traditional discourse analysis, involving "the study of how sentences in spoken and written language form larger meaningful units such as paragraphs, conversations, interviews, etc."(Richards *et al.*1992), or as Gee (1999) puts it "language-in-use" (p. 17). This latter can be said to be only a portion of the Discourses with a capital D, which are "language plus 'other stuff' " (Gee 1999, p. 17):

> Discourses [with a capital D] are ways of being in the world, or forms of life which integrate words, acts, values, beliefs, attitudes, and social identities, as well as gestures, glances, body positions and clothes. A Discourse is a set of identity kit which comes complete with the appropriate costume and instructions on how to act, talk, and often *write* [my italics], so as to take on a particular social role that others will recognize (Gee 1996, p.127) .

Discourses (with a capital D) are situated among members of a community. We cannot conceive of a Discourse without taking into account the community that the Discourse is an attribute of. In other words, we cannot abstract a Discourse from *its* people:

> …Discourses …are …ways of displaying (through words, actions, values and beliefs) membership in a particular social group or social network, people who

> associate with each other around a common set of interests, goals, and activities. A Discourse, then, is composed of ways of talking, listening (often, too, reading and writing), acting, interacting, believing, valuing, and using tools and objects, in particular settings at specific times, so as to display and recognize a particular social identity (Gee 1996, p. 128).

Gee (1996) further distinguishes between primary and secondary discourses. He defines the former as those we have acquired in the early years of our lives, and the latter as the Discourses we acquire later on in our lives. Borrowing the concepts of acquisition and learning from Krashen's monitor model of second language acquisition, he argues that both primary and secondary Discourses can only be acquired:

> Discourses are *mastered* [original emphasis] through acquisition, not through learning. That is, Discourses are not mastered by overt instruction, but by enculturation (apprenticeship) into social practices through scaffolded and supported interaction with people who have already mastered the Discourse… If you have no access to the social practice, you don't get into the Discourse—you don't have it (Gee 1996, p. 139).

As I have already explained, Wenger (1998) includes 'discourses' in the 'shared repertoire' of a community of practice (also see my account of Gerholm 1985, in section 2.2.). However, it is not clear in what sense he is using the term. The concept of Discourse as used by Gee (1996), although clear, seems to be too broad for the purposes I am pursuing in the present study. This is because Gee's concept of Discourse includes almost any type of discourse whereas I am particularly focusing on academic discourse. Therefore, I propose the following definition for Academic Discourse:

> Academic Discourses are disciplinary and institutional rules (whether overt or covert) regarding student-supervisor relationships, student-student relationships, types of documents used in a discipline, ways of displaying one's knowledge, and ways of writing.

However, I would like to admit that the definition given above could only be regarded as a first attempt and it will undoubtedly need to be further revised and modified.

I would also like to add that the use of acquisition/learning distinction in Gee`s argument does not seem to be unproblematic. This distinction was first used by Krashen (1981, 1985) in an endeavour to present a theory of second language acquisition. Krashen called his theory the Input Hypothesis, in which he included five hypotheses. He argued these formed the nucleus "of an overall theory of second language acquisition" (1985, p. 1).

Krashen's theory, however, has received strong criticisms for being too ambitious. McLaughlin (1987) in a highly critical chapter in his book rejects Krashen's acquisition theory. He argues against all five hypotheses in this theory and at the end concludes that Krashen's theory does not possess the qualities of a good theory. One such good quality is falsifiability, whereas Krashen's theory is not falsifiable. He writes "[a] theory is falsifiable only if its parts are testable and all untestable parts are related to testable ones. But Krashen has not related the *i+1* [one of the hypotheses in Krashen's theory] to any observable or measurable variable" (McLaughlin 1987, p. 57). Another point that he raises is that Krashen does not clarify the distinction between acquisition and learning, "the point is that there needs to be some objective way of determining what is acquisition and what is learning. This Krashen does not supply" (p. 22).

Skehan (1989, 1984), too, has criticised Krashen's Monitor Model because its components seem to be contradictory. Skehan exemplifies this by mentioning

Krashen's argument according to which there is no relation between acquisition and learning, and shows that this is contradicted in another part of the model:

> … the separation and the postulated imperviousness of acquisition to effects of learning, means that the [individual differences] that may exist in the amount of Monitor use (i.e. 'over' and 'under' users) do not connect up with other, more central aspects of the model. To allow this to happen learning would be having an indirect effect, and the model would be self-contradictory (1989, p.3).

One can argue that Gee's (1996) use of the acquisition/learning dichotomy can be criticised on the same grounds as Krashen's. The hidden ideology of acquisition/learning distinction in both Krashen's and Gee's conceptions seems to be consciousness/subconsciousness distinction, which, I argue, is problematic. We can resolve this problem if we take acquisition as 'informal processes' through which new members learn, as opposed to 'formal ways' of learning (Street, personal communication). By 'informal processes' I mean learning is situated in nature and is a progressive process. This way of looking at the issue of learning takes away the need to use Krashen's terminology of 'acquisition/learning', which has taken on certain connotations that cannot be overcome easily. Looking at learning in communities of practice as 'informal processes' is in line with my position in contexualising this study in the 'social turn movement' (Gee 2000) tradition. As I explained in the previous section on 'communities of practice', Wenger (1998) does not focus on the distinction between acquisition and learning; nevertheless, his account of learning is situated in nature and is congruent with my account of learning above. I should also add that in another work Gee *et al.* (1996) refer to 'deep learning', which is probably a modification of his account of acquisition:

> Learning works best— it is most enculturating, but (alas) also most indoctrinating— when it is done *inside* the social practices of a Discourse. Such

> 'deep' learning always involves the formation of new identities and thus possible conflicts with old ones. (Gee, *et al.* 1996).

They also mention participation in social practices as a key determinant of learning, which is quite similar to Wenger's (1998) belief on this described earlier: "Learning— if it is not a senseless activity, which regrettably it sometimes is— is a process of entry into and participation in a Discourse" (Gee *et al.* 1996, p. 15).

Gee (1996) also refers to ideologies prevalent in Discourses. He observes that in any instance of Discourse, there are 'theories' that define appropriateness and inappropriateness (1996, p. ix). I believe this concept can be extended to 'appropriateness' in 'discourse communities'. Any discourse community has its own theory of 'normal' members and 'right' ways of thinking. In fact, we can conceptualise these ideologies in frameworks within which 'members' *are* members. If newcomers do not practice within the framework of these ideologies, they will not be given the "credit" or "badge" of membership.

In sum, the concept of D/discourses proposed by Gee (1996; 1999) is a powerful tool in defining the norms and expectations that newcomers to a community of practice should acquire in order to be considered legitimate members of these communities. As I will explain in *Chapter 8*, Discourses can in fact be taken to be equivalent to two of Wenger's (1998) dimensions of practice, namely 'mutual engagement' and 'a shared repertoire'. I will argue that we can conceive of two types of Discourses, participatory and reificatory, which are related to Wenger's (1998) 'mutual engagement' and 'a shared repertoire' respectively. In the next section, I will widen the scope of this argument by elaborating on Discourses in discourse communities.

2.4. Discourse Communities

Casanave (1995) attributes the concept of 'communities' of scientists to Kuhn, who is most famous for his account of scientific paradigms and revolutions:

> A scientific community consists,…, of the practitioners of a scientific specialty. To an extent unparalleled in most other fields, they have undergone similar educations and professional initiations; in the process they have absorbed the same technical literature and drawn many of the same lessons from it. …the members of a scientific community see themselves and are seen by others as the men [*sic.*] uniquely responsible for the pursuit of a set of shared goals, including the training of their successors (Kuhn 1996, p. 177).

It can be argued that Swales (1990) is one of the pioneers to operationalise the concept of discourse communities. He defines discourse communities as "sociorhetorical networks that form in order to work towards sets of common goals." He further distinguishes six defining characteristics for discourse communities, which are as follows:

1. A discourse community has a broadly agreed set of common public goals.
2. A discourse community has mechanisms of intercommunication among its members.
3. A discourse community uses its participatory mechanisms primarily to provide information and feedback.
4. A discourse community utilizes and hence possesses one or more genres in the communicative furtherance of its aims.
5. In addition to owning genres, a discourse community has acquired some specific lexis.
6. A discourse community has a threshold level of members with a suitable degree of relevant content and discoursal expertise (pp.24-27).

Swales (1990), however, does not give a clear definition of Discourse in the way Gee (1996; 1999) talks about it. Nevertheless, it can be inferred that his concept of discourse, although socially oriented, stems from a linguistic stance. This is particularly manifested in the distinction he makes between speech communities and discourse communities.

He argues for a distinction between these two concepts for three reasons. The first reason is that the medium is different in these two concepts. Members of a discourse community often tend to communicate with each other via writing. The second distinguishing feature between discourse and speech communities, according to Swales (1990), is that the "primary determinants of linguistic behaviour are social" (p.24) in speech communities, whereas those of a discourse community are "functional" (p.24). Members of a discourse community often have similar objectives to pursue although this will ultimately lead to socialisation. But speech communities tend to have different communicative priorities such as "socialisation or group solidarity" (p. 24). In other words, members of a discourse community come together, in order to follow objectives that are beyond socialisation. The third reason for the distinction between speech and discourse communities is that a speech community "inherits its membership by birth, accident or adoption," while members of a discourse community are often 'trained' in order to receive membership credit (Swales, 1990, p.24).

One could argue that all of the above features by Swales which emphasise language can be subsumed within Wenger's model for dimensions of practice described earlier, and this offers scope for further research. Nevertheless, for the purposes of my work it is sufficient to use Wenger's model.

In a related study, Berkenkotter *et al.* (1991) emphasised the distinction between speech and discourse communities and argued:

> Academic or professional discourse communities are not necessarily located in specific physical settings, but rather their existence can be inferred from the discourse that members of a disciplinary subspecialty use to communicate with

each other(p.191).

They add that the discourse used by a community defines that community and is the product of that community at the same time (p. 192).

The use of the concept of 'training' as mentioned by Swales (1990), is vague in the sense that it is not clear whether Swales believes that members of a discourse community learn their Discourses through 'formal' or 'informal' routes (cf. my account of these in section 2.3. above). Although the concept of training suggests a 'formal' perspective, Swales does not seem to be entirely consistent with regard to these, as he writes elsewhere "individuals enter [discourse communities] as apprentices…" (p.27). The use of the concept of 'apprenticeship', I assume, is closer to 'informal' rather than 'formal' ways of learning. In contrast, Gee's (1996; 1999) position is very clear and he argues that Discourses can only be learned through acquisition (p. 139), which seems to be in line with an 'informal' understanding of learning. In addition, as suggested earlier, Swales stance is mainly a linguistic one with regard to the concept of discourse, while Gee's is much broader in scope and includes language amongst other elements.

Another attempt to operationalise the concept of discourse communities was made by Beaufort (1997), who defined discourse communities in the following way:

> A discourse community is a dynamic social entity within which a set of distinctive, yet changeable, writing practices occur in relation to other modes of communication as a result of the community's shared values and goals, the material conditions for text production, and the influence of individual community members' idiosyncratic purposes and skills as writers (p. 522).

Building upon works by other scholars in various disciplines, she further argued that a discourse community would have the following pattern of communicative practice:

> A synthesis from the world of anthropologists (Basso, 1974; Chin, 1991; Heath, 1981), rhetoricians (Bazerman, 1988; Rafoth,1990), and sociologists (Gunnarsson,1997; Swales,1990) who have focused in particular on notions of writing in relation to social contexts leads me to suggest three critical features to any discourse community that can be identified and which describe a pattern of communicative practice. A discourse community requires:
>
> 1. Modes of communication - oral and written - whose interplay affects the purposes and meanings of written texts (Bassso, Heath)
>
> 2. Overarching norms for text with regard to genre features, which may be unique to a given community or shared with overlapping communities (Swales)
>
> 3. Roles for writers (including how writing roles are distributed, and specific writing tasks as defined by the communicative situation (Basso, Swales) (cited in Beaufort 1997, p. 489).

Beaufort (1997) also pointed out "a set of underlying values and goals, material conditions, and individual writers' histories" as three influencing factors in any discourse community:

> In addition to examining communicative activities focused around writing, a discourse community's properties can be understood by examining three influencing factors:
>
> 1. a set of underlying values and goals for the community that influence all aspects of text production (Rafoth, Swales)
>
> 2. material conditions, such as spatial relations among participants, and available tools for communication, that influence writing activities (Chin,Gunnarson)
>
> 3. Individual writer's histories, goals and skills as brought to bear on community writing practices (Bazerman) (cited in Beaufort 1997, p. 489) (p.489).

The following diagram shows the interrelationship of communicative activities and influencing factors discussed above:

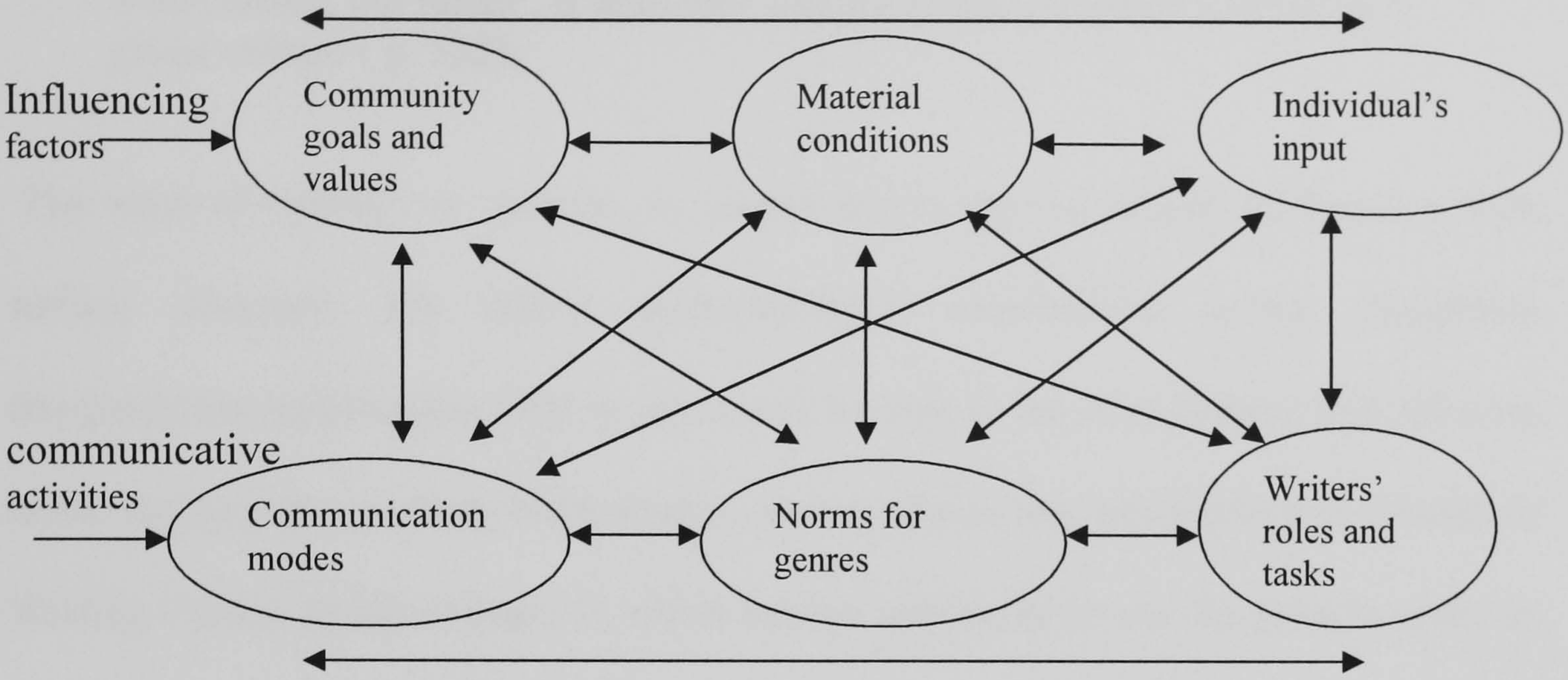

FIGURE 2.3: From: Beaufort 1997, p. 490

Community goals and values is comparable with Swales' (1990) first defining characteristic of discourse communities mentioned earlier in this section. *Material conditions* refers to the spatial relationships among participants and tools that might influence communication amongst other things and does not seem to have a direct counterpart in Swales' work. Beaufort's analysis, however, can be criticised on the grounds that it is too complex and not easily interpretable, while one of the main purposes of models is to simplify concepts and make them more comprehensible. In the following section, I will briefly mention the relation between the theory of communities of practice and discourse communities.

Beaufort (1997) has categorised discourse communities as specific cases of communities of practice:

> Communities of practice, as defined by Lave and Wenger (1991), share many properties in common with discourse communities as described in this study, but their focus is not exclusively on writing activities. Genres are the critical product of a discourse community, whereas assisting in navigation or childbirth (two communities of practice Lave and Wenger cite) yield different products. Nor is *discourse community* synonymous with culture, but rather , it describes one particular patterned activity in a given culture (p. 522).

'The ways of writing' or 'genres', as quoted above, are not simply different in their surface structure, but reflect epistemological orientations across disciplines (Berkenkotter and Huckin 1995, p. 4). It will be seen in the next chapter that Ali (one of the engineering students under study), among others, had participated in Academic Writing Classes in his college, in which he was instructed to use the passive voice in his writing. This could be regarded as stemming from a positivistic epistemology prevalent in science and engineering disciplines, according to which "academic research is purely empirical and objective, and therefore best presented as if human agency was not part of the process" (Hyland 2001, p. 208). Hyland quotes Albert Einstein as follows, "when a man is talking about scientific subjects, the little word 'I' should play no part in his expositions" (Einstein 1934, p. 113). This positivistic tradition can be argued to be among the *community goals and values* of the discourse community Ali had entered, or was trying to enter, in his college. It can also be seen that Ali used oral language to report on his activities to his supervisor whenever they met, and he used writing only when they could not meet in person, which can be taken as an instance of *communication modes*. Therefore, 'genres' or 'ways of writing' in discourse communities can be regarded to be among the 'shared repertoire' (Wenger 1998) of such communities that are often rooted in their epistemological positions.

The *writers' roles and tasks* in the model above, however, requires further consideration, as PhD students seem to be neither full participants of a research community with regard to the texts they produce, nor outsiders who do not know anything about the norms of their disciplines. Lave and Wenger's (1991) concept of *legitimate peripheral participation* seems to have good explanatory power in this case.

Beaufort (2000) made use of the x-y analogy borrowed from mathematics to show the relationship between knowledge of discourse conventions of the discourse community, responsibilities novices take on in the community, and their socialisation into the research community:

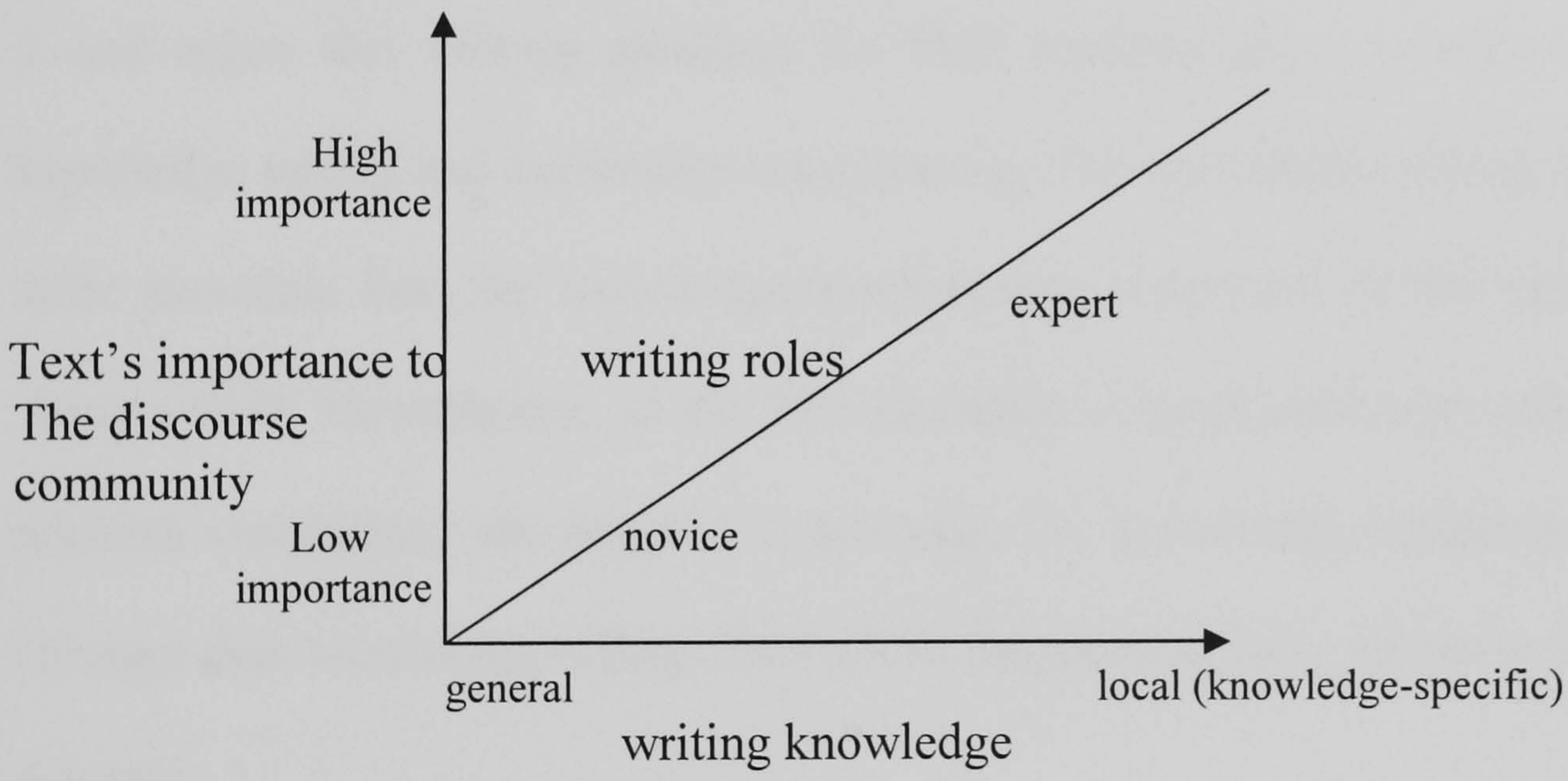

FIGURE 2.4: Socialisation process of writers

> Note: as writers in a discourse community increase their knowledge - specific (or local) to that site of composing, they take on increased responsibilities and more complex writing roles required to produce high - status texts (Beaufort 2000, p. 214).

The first impression one gets from the diagram above seems to be in contrast with Geisler's (1994) idea about the writing practices of experts and novices. Geisler believes that these practices are different in character, in that experts' writing

practices are intended for the purpose of the transformation of knowledge, while those of the novices serve to display knowledge. These have been called knowledge telling and knowledge transforming by Bereiter and Scardamalia (1987) to refer to writing practices of novices and experts respectively. However, there is a sharp difference between these two issues in that the cases under study in Beaufort's (2000) research were engaged in real situations, while this is not necessarily the case with undergraduate students under Geisler's study.

Looked upon from a slightly different perspective, one can argue that the issue of knowledge telling/knowledge transforming need not necessarily be an either/or category. If we combine Geisler's argument with the diagram above, we can reframe it and argue that writing practices for PhD students are a combination of both knowledge telling and knowledge transforming. The knowledge-telling component is more prevalent than the knowledge-transforming component in the initial stages of doing a PhD. Nevertheless, as the PhD candidate is inculcated more and more in the research community, the situation is reversed, i.e., knowledge transforming becomes stronger than knowledge telling. This can be diagrammatically shown in the following diagram:

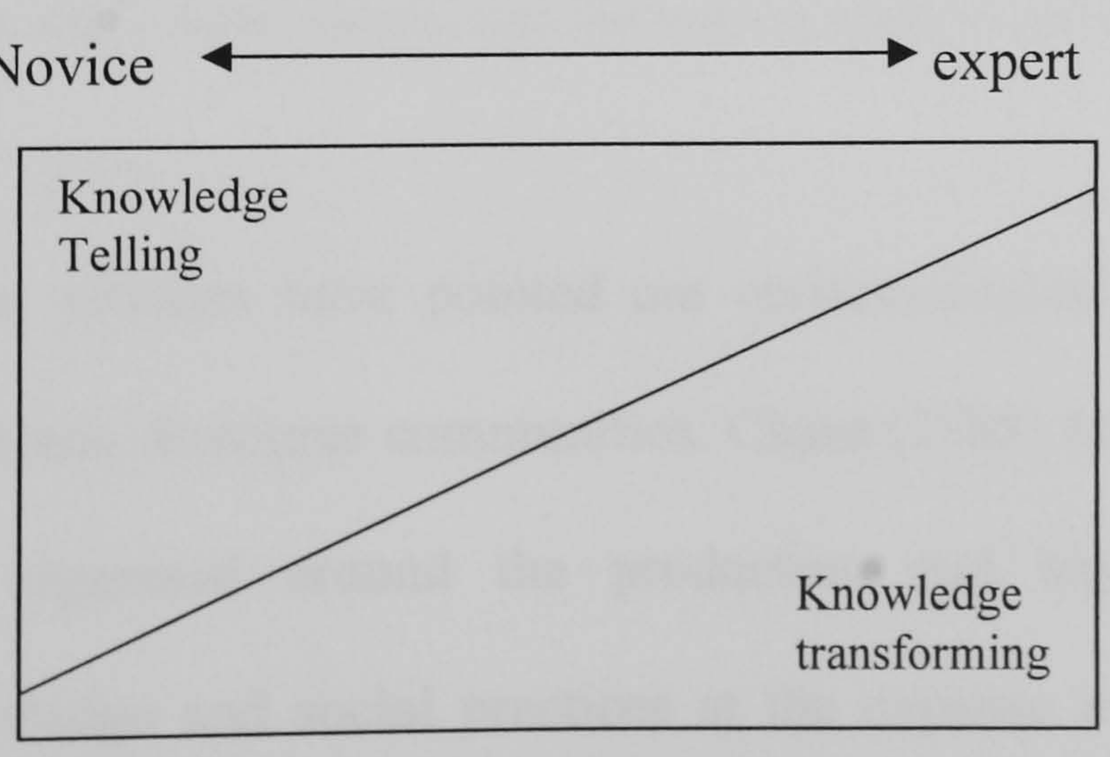

FIGURE 2.5: The degree of knowledge telling and knowledge transforming in the writing practices of novices and experts.

It can also be argued that the move need not necessarily start from novice to expert. It can start right in the middle of the borderline between novices and experts shown below. The borderline will gradually open up and fade in the process of inculcation until it is dissolved (Street, personal communication):

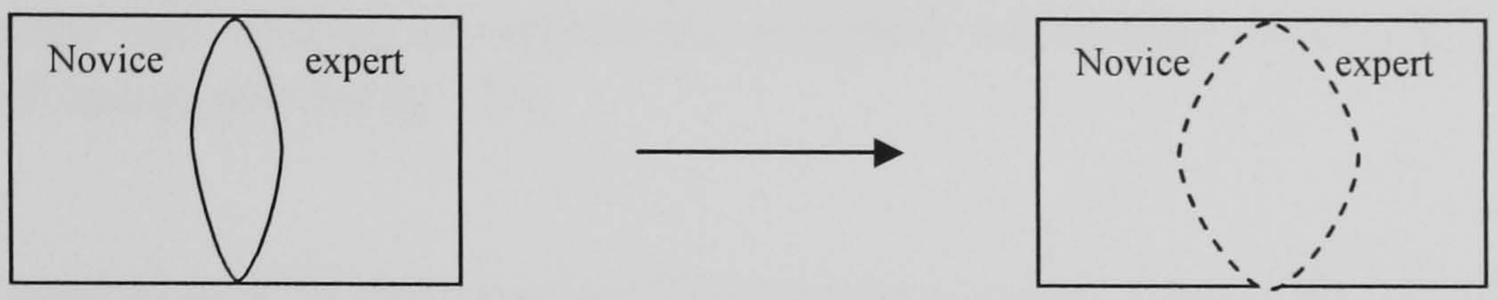

FIGURE 2.6: The borderline between novice and expert gradually disappears

Belcher (1994) in a case study on three students and their advisers found that the first student, although quite fluent in English, did not finish his studies due to a lack of collaborative relationship between the student and the supervisor, which would lead to students' gradual attachment and membership in the research community. The second student was able to finish his studies, although with difficulty. However, the most successful student was the third student, who had scant linguistic ability, but was successfully absorbed in her research community. Belcher's finding can be significant in that it shows linguistic problems of non-native students might not be as significant as it is usually assumed to be. Success in being appropriately socialised seems to be a more significant factor, and the role of supervisor in this process is quite significant.

Some scholars have pointed out epistemological issues concerning the concept of academic discourse communities. Chase (1988) believes that "discourse communities are organised around the production and legitimation of particular forms of knowledge and social practices at the expense of others, and are not ideologically innocent" (p.118). Clark (1992) further clarifies the concept of academic discourse

community and states that any discourse community has a set of shared beliefs about legitimate knowledge, the ways of transferring and learning that knowledge, and appropriate behaviour of members of the community (p.118). Connor (1996), in a similar endeavour states:

> …novices in discourse communities need to learn both the conventions of language and writing as well as the accepted world view of the disciplinary values and practices (p. 77).

The ideas mentioned in the previous paragraphs on the concepts of 'discourse' and 'discourse communities' are reflected in the following quotation from Gee (1996):

> A *Discourse* is a socially acceptable association among ways of using language, other symbolic expressions, and 'artefacts', of thinking, feeling, believing, valuing, and acting that can be used to identify oneself as a member of a socially meaningful group or 'social network', or to signal (that one is playing) a socially meaningful 'role' (p.131).

It is obvious that writing is one of the important features of any academic discourse community. Beaufort (1997) underlines the importance of writing in distinguishing between different discourse communities (p.518). Ramanathatn and Kaplan (1996), too, point out the same idea and add, "each discipline constitutes its own 'culture' in the sense that each discipline has its own conventions and rules regarding what characterises effective and appropriate writing for that discipline" (p. 29).

Russell (1991) in an extensive study followed the development of academic writing in different disciplines in the United States. He writes that before the 1870's, writing only had a secondary role in relation to speech. "For a speaker, writing was only an aid to memory; for a reader, it was merely a substitute for a present speaker … Literacy meant knowing one's ABC's" (p.4). However, he writes, by the 1870's, the

function of writing began to change. It was no longer a substitute for speech, but it was used for other communicative purposes among members of new academic communities emerging in that period. Writers no longer wrote for general readers, but for colleagues sharing the same activities and goals (pp. 4-5). Second and third generations of disciplines brought with them new conventions of writing:

> Each discipline, each kind of institution, developed its own "literacy," its own tacit expectations about how its members (and its students) should write (p. 5).

I will come back to Russell (1991) later when I refer to two different conceptions of writing in academia. The idea that each discipline is a culture has led some researchers to look upon the process of learning the conventions governing each discipline as acculturation (Purves 1986,p. 39), socialisation (Beaufort 2000,p. 218), academic socialisation (Lea and Street 1998), and enculturation (apprenticeship) (Gee 1996, pp. 139; 72; 44-45; Berkenkotter and Huckin 1995, pp. 7).

It is interesting to note that all the concepts mentioned in the previous paragraphs can be linked with Gee's (1996) argument that Discourses in different disciplines can only be acquired, i.e. learned 'informally'. Russell, too, makes a similar comment. Building upon theories of first language acquisition, he writes:

> The neophyte gradually acquires the community's shared knowledge not only by listening and reading but also by experimenting with verbal formulations, orally, as with children, and later in writing, through situations embedded in the life of the neophyte's community, whether the family or the discipline. Like adults talking to babbling children, the more skilled members of the disciplinary community, instructors, supervisors, or more experienced peers, recast the neophyte's utterances in a form suitable to the community… (p.15)

Russell's use of the metaphor 'neophyte' above is strikingly similar to the concept of 'apprenticeship' used by Vygotskyians (cf. also Geisler's concept of novice/expert which I will explore below). According to Duveen (1997), "the metaphor of apprenticeship is employed to give concrete expression to Vygotsky's idea of the zone of proximal development" (p.80), which is defined "as the distance between a child's 'actual developmental level as determined by independent problem solving' and the higher level of 'potential development as determined through problem solving under adult guidance or in collaboration with more capable peers'" (Vygotsky 1978, p.86, in Daniels 1996, p.4).

Wertsch (1985) explains that Vygotsky was primarily interested in the measurement of the development of children. He adds that this interest, however, was in contrast with the way child development was conceived of in the United States:

> American researchers are constantly seeking to discover how the child came to be what he is; we in the USSR are striving to discover not how the child came to be what he is, but how he can become what he not yet is (Bronfenbrenner 1977, p. 528, in Wertsch 1985).

These ideas of scaffolding and seeking assistance from skilled people are comparable with Wenger's (1998) learning theory in communities of practice, which I described earlier in this chapter. Wenger does not separate *learning to do things* from the actual engagement in *doing things.* Rather, he seems to believe that learners take part in activities in order to master them. He writes that "[learning] is an ongoing and integral part of our lives, not a special kind of activity separable from the rest of our lives" (p. 226).

This concept of 'situated learning', i.e. participating in real practices to learn, suggests that Wenger (1998) believes in 'informal' learning rather than 'formal' learning. This is comparable with Gee's (1996) distinction between acquisition and learning explained earlier. As it will be seen in the following chapters, Dr.e1, one of the engineering supervisors in my study, involved his students in the actual practices of writing papers and lecturing at undergraduate level to help them acquire these skills, which can be seen as instances of 'situated informal' learning in PhD education. However, we should be aware not to rule out the role of formal learning altogether. In fact, although simplistic, it is possible to consider learning as a coin, one side of which is 'formal' and the other is 'informal'. My position here is that the 'informal' side of the coin has not been given the weighting it deserves.

Academic discourse communities have also been discussed with regard to their power relationships. Clark (1992), for example, believes that power is not equally distributed in academic discourse communities. She writes that members of staff have the upper hand in institutions, and they are the people who decide on legitimate knowledge in each discipline. She also points out that students, too, may assess members of staff, but the assessment the staff do of the students is certainly more powerful.

In sum, a discourse community is a complex phenomenon that is rooted in the concept of speech community. Although some studies have been done to clarify its dimensions, more work is still needed. Furthermore, the concept of scaffolding seems to be embedded in the theories of discourse communities and communities of practice. As I will explain later discourse communities can in some sense be regarded as specific cases of communities of practice.

The concept of scaffolding seems to permeate all the theories of discourse communities and communities of practice. As the main function of scaffolding is to help novices socialise into research communities, it seems necessary to elaborate on the concept of 'socialisation'. Resnick (1997) defines child socialisation in the following way:

> The term *socialisation* refers to the incorporation of the individual as a member of a community (p. 152).

The word "socialisation," however, has been criticised on the grounds that it implies a unidirectional relationship, as "something that society does to individuals" (Myers 1993, p.361). Myers (1993), however, argues that individuals are both shaped by disciplines and shape disciplines. Morita (2000), too, in a study on language socialisation argues for a bi-directional and dynamic relationship between novices and experts, and writes, "Novice members actively seek and structure the assistance of more competent members; as a result, competent members also learn from novices" (p. 282). I would agree with the bi-directional definition of socialisation since it captures the dynamic nature of academic socialisation. As I will explain in *Chapter 8*, a promising area for further research would be the way novices affect and are affected by others.

Lave and Wenger (1991) refer to academic socialisation and write:

> As students begin to engage with the discipline, as they move from exposure to experience, they begin to understand that the different communities on campus are quite distinct, that apparently common terms have different meanings, apparently shared tools have different uses, apparently related objects have different interpretations.... As they work in a particular community, they start to understand both its particularities and what joining takes, how these involve language, practice, culture and a conceptual universe, not just mountains of facts (p. 13).

As can be seen in the above paragraphs, the theories of situated learning, communities of practice, and the concept of academic socialisation into discourse communities have the 'social' as their starting point. It can be argued that research students are socialised into their respective research communities through certain paths. One of these, obviously, is being exposed to the literature of their fields of study, which in a way constitutes part of the 'shared repertoire' (Wenger 1998) of their communities of practice. Another is through engagement in academic writing, which can be considered as a sort of 'legitimate peripheral participation' (Lave and Wenger 1991). In the next section, I will explore the role of academic writing in the overall socialisation of research students into academia.

2.5. Academic Writing as a Tool in Academic Socialisation

Russell (1991) in an extensive history of writing in disciplines refers to a misconception about the relation between writing and knowledge in disciplines, in the sense that they were, and probably still are, taken to be quite distinct from each other. Based upon this misconception there is a difference between the main 'business' of engaging in scientific activities, and the 'expression' of the knowledge gained through this process. (p. 5-6). One corollary of this misconception was that writing was taken to be a generalisable skill that once learned could be transferred to other contexts. Therefore, the function of writing in disciplines was often 'examination' and 'demonstration' of the knowledge of topics and issues of interest in disciplines rather than 'teaching or acquiring' these (pp. 5-6):

> ... Because academics and other professionals assumed that writing was a generalizable, elementary skill and that academia held a universal, immutable standard of literacy, they were constantly disappointed when student writing failed to measure up to the local, and largely tacit, standards of a particular

> social class, institution, discipline, or profession by which they were in fact judging that writing (p. 6).

Russell (1991) goes on to argue that writing is in fact a 'social' enterprise rather than a generalisable and transferable skill and writes:

> As a social activity, writing is inevitably embedded in and conditioned by a community. By its very nature it is local, context specific, dependent on a community for its existence and its meaning. *Literacy* is thus a function of the specific community in which certain kinds of reading and writing activities take place (p. 12).

Russell's conceptualisation of writing as a social activity can be regarded as parallel to the 'social turn movement' discussed earlier, and specifically to the academic literacies tradition (Lea and Street 1998).

It can be argued that one of the important social practices in which members of an academic community engage in is academic writing, which is also one of the venues through which novice members get familiar with the 'Discourses' (Gee 1996;1999) of their discourse communities (Swales 1990). One of the lines of enquiry on academic communities, therefore, has been the writing practices of novices and experts.

As I pointed out earlier, the literacy practices of professionals and novices are often erroneously taken to lie along a continuum in which novices strive to approach professionals. However, "these two sets of practices are substantially different in character. In particular, the literacy practices of experts in the academy are organized around the creation and transformation of academic knowledge; the literacy practices of novices, on the other hand, are organized around the getting and displaying of that knowledge" (Geisler 1994, p.81).

Apart from the differences between the writing practices of novices and experts, writing itself is regarded as one of the main tools in the enculturation of novices into discourse communities. Casanave (1995) believes that the socialisation of novice members to the community is carried out through writing:

> By writing discipline-specific documents, students are learning to speak like members of the discipline…and to represent in conventional ways what the field does…writing can thus function to introduce novice community members to discipline-specific issues that lie buried in jargon and the research activities—issues that ultimately have to do with what it means to identify oneself as a member of a discipline or profession (p.86).

In addition, the discipline-specific writing referred to above also functions as a screening device to separate members from non-members:

> The tribes of academe, one might argue, define their own identities and defend their own patches of intellectual ground by employing a variety of devices geared to the exclusion of illegal immigrants (Becher 1989, p. 24).

Berkenkotter *et al.* (1991), using sociolinguistic and sociology of knowledge theoretical frameworks traced the academic socialisation of a PhD student through the introductions he wrote to his academic papers. One of the findings of this study was that "papers and publications are among a research community's *communicative forums;* significant issues are raised, defined and debated within these forums. In this sense, to publish and to be cited is to enter the community's discourse" (p. 193).

Riazi (1997) studied the acquisition of academic literacies of four Iranian research students of education in their academic seminars. He framed his studies within social-cognitive approaches to writing, which is quite similar to a social understanding of writing as discussed by Russell (1991) and Street (1984):

A social cognitive perspective [on writing] examines how writers—from early childhood through to adult years—form interactive relationships with teachers, peers, and contexts that shape their learning, that become part of their individual thinking and part of their [sic.] what they write, how they write, and for whom they write. Writing researchers from a social-cognitive perspective seek to understand writing as situated cognition (see, for example, Berkenkotter, 1991; Flower, 1989; Flower et al., 1990). The key issue to conceptualising learning in terms that are useful for education is to find how individual intention and agency insert themselves within and help construct culturally and socially organized practices (p. 110).

One of the interesting findings of this study was that writing not only helped students learn topical knowledge, but also it helped them acquire the "knowledge of discourse communities (audience, discourse conventions, and important issues in a field), knowledge of L2, knowledge of disciplinary genres, and development of certain academic skills" (p. 133).

Lea and Street (1998), likewise, situate academic literacies among epistemologies in different disciplines, adding that there are often inconsistencies among institutions, tutors and students regarding what constitute academic writing. They exemplify this by a case in which a supervisor's feedback on a student's writing such as "lack of structure and argument" (p. 165) did not have the same meaning for both parties. Their analysis is important in that it raises a fundamental question regarding understanding the nature of academic writing before trying to 'fix' problems students might have with it.

Other researchers have tried to study the differences among different disciplines regarding academic writing. Hyland (1999), for instance, analysed 56 research articles in terms of linguistic signals used by writers to show their 'stance'. Borrowing Campbell's (1975) definition of 'stance', he defined it as "the ways that writers

project themselves into their texts to communicate their integrity, credibility, involvement, and their relationship to their subject matter and their readers" (p. 101). He takes 'stance' as having the following three components: evidentiality, affect and relation:

> Evidentiality refers to the writer's expressed commitment to the truth of the propositions he or she presents ... Affect involves the declaration of a broad range of personal and professional attitudes towards what is said or the person who says it, including emotions, perspectives and beliefs. Relation concerns the extent to which writers choose to engage with their readers…(p.101).

Hyland (1999) further operationalised the concept of 'stance' in terms of certain linguistic categories, including *hedges* such as "*possible, might,* and *perhaps,"* and the *person* markers (use of the first person pronoun) among others. He reported that research articles in the humanities used 30% more stance expressions than articles in engineering and sciences. He interpreted this finding in terms of the different epistemological positions of the sciences on the one hand, and those of the humanities on the other, arguing that the prevalent positivism in sciences favours "authority of the text" to the "authority of the individual". He further adds:

> The results emphasise the point that social relationships within discourse communities exercise strong constraints on a writer's representations of self and others. Equally, however, an analysis of stance markers also reveals a great deal about the norms and epistemologies of those who use them (p.121).

Therefore, it can be argued that novice PhD students seem to engage in a community of practice whose main objectives are to produce and disseminate knowledge. These academic discourse communities make use of certain practices to achieve these aims. One such practice is engaging in a form of *academic writing,* which is part of their *shared repertoire* and is employed to negotiate meaning among members of the community.

There has been particular attention to the process of production of knowledge through academic writing in studies concerning the ethnography of sciences. In an extensive ethnographic study of a group of scientists working in a laboratory, Latour and Woolgar (1979) found that "the production of papers [was] the main objective of [these scientists'] activity" (p.71). They further categorised five different types of statement found in scientific documents, ranging from statements pointing to *taken-for-granted* issues or *facts,* to mere *conjectures* and *speculations.* They pointed out that the main problem for these scientists was to "persuade readers of papers (and constituent diagrams and figures) that its statements should be accepted as facts…" (p. 88).

Flowerdew (2000) in a related study investigated the process a NNS (non-native speaker) PhD holder in Hong Kong University went through to publish a paper in a refereed journal. Flowerdew modelled his investigation on Lave and Wenger's (1991) concept of legitimate peripheral participation and Swale's (1990) concept of discourse communities. He reported that apart from linguistic difficulties caused by the subject's non-native status, the fact that he was *removed* from his relative discourse community resulted in many problems in getting his paper published, although he finally managed after numerous revisions.

I would argue that writing, for PhD students, is both an end and a means. It is an *end* in the sense that PhD students are ultimately assessed through the written document they have produced. Therefore, it is part of the Discourse conventions they have to acquire in order to be socialised into their research communities. It is a *means* in the sense that it is one of the important mediums through which Discourses are acquired.

Students often attain content knowledge and the writing conventions of their discourse communities through writing and comments they receive from their supervisors.

Apart from access to academic writing practices, research students need to have access to the overall research culture to be fully socialised into their respective research communities. Deem and Brehony (2000) in a qualitative study researched PhD students' access to research cultures. "The cultures to which [they] refer are not simply those which pertain to particular academic disciplines… but also those related to student and academic life in the social sciences more generally, including student cultures and research training cultures" (p. 14).

They explain that the meaning of 'research culture' is different in science and non-science disciplines. They refer to research conducted by previous researchers (Burgess, 1994; Parry *et al.*, 1994; Delamont *et al.*, 1997a, 1997b), which has examined "how research topics are chosen, the nature of supervisory practices, and the environment in which postgraduate research is conducted" among these differences:

> In laboratory-based science subjects, research students are attached to research teams that include post-doctoral researchers and members of staff…The topic of PhD…is normally derived from a team-based project. Training may be part of a Masters of Research (M.Res) programme or more informal, involving other doctoral and post-doctoral researchers. Students and supervisors meet in the laboratory as well as informal supervisory meetings…(Deem, *et al.*, p. 151)

They further outlined the research culture prevalent in the non-science disciplines:

> In non-science fields, students usually choose their own topic and are rarely attached to a research team… Training is usually formalised. Students and

> supervisors often only meet at formal supervisory meetings…The student is regarded as more autonomous than in science…(Deem, *et al.*, p. 151)

They identified three different types of cultures in the social science disciplines: "the peer cultures of research students themselves qua students, the cultures of research student training, and the cultures of academic disciplines" (p. 152). One of their suggestions was that there is a need for treating research cultures in the framework of research training programmes for non-science fields in order for the students to experience a flavour of working in a team rather than on their own. The 'peer cultures of research students' can be seen as related to 'informal learning', while the 'cultures of research student training' can be seen as 'formal learning'. The 'cultures of academic disciplines' can be taken as target academic Discourses for research students.

I want to make use of the triad Deem and Brehony (2000) envisage for research cultures in the non-science disciplines, and argue that in order to understand the socialisation process of PhD students in different disciplines, we need to take into account these cultures, as they are the sites where PhD students are exposed to the Discourses of their disciplines and are socialised into their research communities. As we will see in the next chapters, many of the findings of Deem and Brehony (2000) are supported in this study. Looking ahead it seems to be the case that there is a *topic-assignment* culture in engineering in which supervisors determine the topics of research for PhD students. This culture did not seem to exist in the social science/humanities sites under my study.

2.6. Conclusion

In this chapter I have tried to build upon three theoretical positions in order to study the ways in which PhD students are socialised into their respective research communities. I argued that the theory of communities of practice (Lave and Wenger, 1991; Wenger 1998) together with Swales' (1990) concept of discourse communities could be used to understand these processes. In addition, I argued for a modified version of the concept of Discourse proposed by Gee (1996; 1999) to be used in the present study. As will be seen in the next chapters, Lave and Wenger's (1991) theory can help us explain some of the practices in PhD education, such as the way some engineering PhD students in my study were initiated into research. However, it seems that we should look for other explanations for certain cases.

In general, my account in the present chapter has been to foreground the 'informal routes' of learning in PhD education. This, however, does not contradict the role and importance of 'formal routes', such the training workshops and modules, rather it is complementary to that. As I will show in the following chapters, most of the accounts I collected from the supervisors and students under this study were about these informal routes, which have surprisingly received little attention in the research training modules for PhD education in UK universities. I will also show in *Chapter 8* that the dimensions of practice as explained by Wenger (1998) do not seem to be enjoying internal and external validities and I will provide a modified framework to capture these.

CHAPTER THREE

A PRELIMINARY LOOK AT THE DATA

3.1. Introduction

It might seem strange to have this heading for Chapter Three of a thesis, especially when the following chapter has the word "Methodology" in its title, and it is usually after Methodology chapters that descriptive data are discussed. Nevertheless, this arrangement is motivated by certain considerations, which I hope will be appreciated once these are discussed.

First, this arrangement is congruent with the way my research unfolded. In fact, I started to collect ethnographic data before actually having a very clear idea of the methodology. This is not to say that I did not know what ethnographic data was, or how interviews should be collected, as I had become familiar with these through departmental workshops and seminars. What I mean is that I learned these in the real sense of the word when I actually engaged with them myself. Before actually starting to collect data, I was not sure how exactly to analyse data. That was why I started with data collection, and struggled with analysing it little by little. When I had collected and analysed some data, I became familiar with Grounded Theory and I found it interesting in the way it approached data collection and analysis rigorously and in an organised way. In short, I collected some data and embarked on its analysis before actually having a very clear idea about a methodological framework. This is one reason for bringing in the data in the present chapter before discussing methodological frameworks.

The next reason why I am going to bring in *A Preliminary Look at the Data* before *Methodology* is that it matches the spirit of the thesis in general and the methodology I used in particular. As I will make clear in this chapter and the following chapter, my methodology turned out to be a constructivist version of grounded theory. This means that I started with a process of open thematic coding followed by categorisation of the codes thus obtained. In addition, the process of data collection and data analysis were more or less conducted simultaneously. One corollary of these would be that the process of open thematic coding is necessarily messy as 'core categories' have not yet emerged, but as the grounded theorist improves his understanding of the social context he is studying, the data and categories become more and more elaborated, organised and less messy. This chapter is partly presented with this aim in mind that the reader will notice this process to some degree. As will be obvious to the reader, the interviews with the students will be presented in case story formats, while the interviews with the supervisors will be presented at a higher level of abstraction. This is because the interviews with the students were mostly conducted and analysed before those with the supervisors. This process of getting from messy and in some instances seemingly unrelated bits of data to higher degrees of abstraction and categorisation will in fact continue throughout the rest of the thesis when I set myself the task of elaborating on different aspect of my analysis.

Last but not least, I should add that I used QSR.NUDIST to help me organise the data. I will refer to some examples of my use of NUDIST in this chapter, and leave a more elaborated account of the use of this software for the next chapter.

3.2. A Descriptive Account of the Data

In the present section, first I will provide a background to this research and then I will give a descriptive account of my data. I will present this section in a way that will, I hope, reflect the grounded nature of my methodology.

I started my research by addressing the problems that academic writing creates for Iranian PhD students in the UK. I was particularly focusing on the roots of these problems from a contrastive analysis perspective (Kaplan 1967, 1987; Connor 1987,1996,1999; Ramanathan 1996), hypothesising that many of their problems were caused by interference from their mother tongue, and different rhetorical patterns they had carried over from their first language context to a new academy in the UK. I was also addressing these problems from an academic literacies (Lea and Street 1998) perspective focusing on the assumptions of both these students and their supervisors concerning what constitutes academic writing.

As I knew that some of the potential participants in my study, such as the engineering students, would work in the framework of a team, I had to answer an important question regarding the effect of working in a team on the writing of these students; therefore, I carried out a pilot study to see if the element of teamwork had any effect on the writing of these subjects. A second goal of the pilot was to get to know my subjects.

In the pilot, I interviewed 42 Iranian PhD students studying in different higher education institutions in the UK. I would like to refer to these as mini-interviews, as I did not tape record them, and they did not take more than five to fifteen minutes each.

Moreover, I only asked three or four questions having the two aims mentioned in the previous paragraph in mind. I found out that even when teamwork was involved. these students were responsible for their own writing. I also came up with an issue that proved to be very interesting. I came across students who were assigned topics by their supervisors and others who were not. I contacted these students again and asked them how they had found their research topics. I received answers from 30 of the students, and based on the answers that I received I found out that the issue of assignment versus non-assignment does not constitute a dichotomy but a continuum. In other words, we can talk of the *degree to which* a student is assigned rather than whether a student is assigned *or* non-assigned. However, for practical purposes I categorised these students in three groups:

1. assigned: these are students who receive their specific topics and the methodology to answer the research questions from their supervisors;
2. semi-assigned: these are students who receive a broad topic, which they have to narrow down themselves;
3. non-assigned: these are the students who formulate their own research questions and methodology.

The following table shows the distribution of the students I interviewed in my pilot according to the above criteria:

	Assigned	Semi-assigned	Non-assigned
Sciences	4 (100%)	0 (0%)	0 (0%)
Engineering	10 (62.5%)	4 (25%)	2 (12.5%)
Medicine	3 (42.8%)	2 (28.6%)	2 (28.6%)
Humanities /social sciences	0 (0%)	1 (33.3%)	2 (66.6%)

TABLE 3.1: Distribution of students, who took part in the mini-interviews, on the basis of topic assignment

We can assume that the issue of assignment cannot be a random phenomenon, but an index pointing to the underlying epistemologies in different disciplines concerning

what knowledge is and how it is learned and transferred to novice members of each academic community (Street and Skehan, personal communication). In other words, different disciplinary epistemologies lead to different practices of assignment, which in turn lead to academic socialisation of the students concerned:

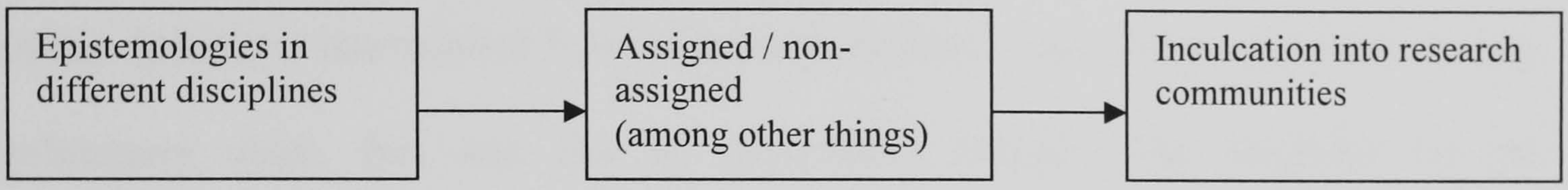

FIGURE 3.1: Relationship between epistemologies and assignment

Therefore, it can be hypothesised that there must be problems that are more important than linguistic and rhetorical problems. In other words, writing problems can be categorised as an effect rather than a cause, and its cause lies deep in the epistemologies in different disciplines.

Based on the findings and interpretations of the above study, I decided to conduct some more interviews with some of these students. My objectives in these interviews were to study:

1. How PhD students are absorbed by their respective research communities,
2. How these students understand the norms and expectations in their disciplines,
3. How they acquire the Discourses followed in their discourse communities.

In this section, I will provide a descriptive account of the interviews I conducted with eight engineering and five social science/humanities students.

3.3.1. Interviews with Students

After the pilot study, I decided to leave out medical and science students, and focus only on engineering and social science/humanities. This was because, given my time and resources, I could not study students from all different fields. In addition, the features found among engineering, medical and science students seemed to be fairly similar. Initially I interviewed 7 of the Iranian students I had contacted before. At this preliminary stage, this was just an opportunity sample. The checklist for the interviews was partly based on the themes suggested by the theoretical models discussed earlier in *Chapter Two*, as well as the data collected in the previous phase of the research. These themes were then used to create a set of questions for the interviews. For instance, some of the themes indicated that members of a community of practice often form working 'relationships' and 'do things together' to achieve a 'joint enterprise'(Wenger 1998). As a result, some of the questions asked in the interviews with students and supervisors were aimed at probing into this aspect of communities of practice. As another example, one of the claims proposed in the previous chapter was that academic writing practices are one of the ways through which PhD students are socialised into their research communities, so this formed another set of questions for the interviews. Overall, the questions in the interviews consisted of the following main categories:

1. relationships in the communities under study,
2. assignment of topics,
3. students' and supervisors' perception of the purpose of doing a PhD,
4. writing practices.

If the main themes mentioned above are compared with FIGURE 3.1, it will be seen that these themes can also be related to epistemologies, practices, and socialisation.

The interviews I conducted took between 20 to 40 minutes. Some of the questions I asked were as follows:

1. Could you tell me about your experience when you first started your studies here?
2. How did you decide what topic to study?
3. How does your supervisor help you in your studies?
4. What do you think are the characteristics of a good supervisor?
5. Could you tell about your relation with other students?
6. What types of writing do you usually engage in?
7. How do you do your writings?
8. What do you think is the purpose of doing a PhD?

The interviews were semi structured, in that I covered certain areas, but I also tried to pay attention to issues that arose during the course of doing the interviews. In addition, after each interview was conducted, I revised the questions for the following interview.

I tape-recorded each interview. The interviews with students, except one of them, were in Farsi, and I had to translate them into English. Then I read each with great care, and coded it on the basis of the themes it suggested. Then I entered all the data and the codes into QSR.NUDIST (See Appendix I).

Out of these initial seven interviews I conducted, five were with engineering students and two with social science/humanities students. In the interest of privacy and considering ethical issues in doing research, I will use pseudonyms to refer to these students and other participants that I will refer to later in this chapter and the following chapters, and the institutions will not be identified either. I will report on the engineering students first, and then I will deal with the two students in the social sciences/humanities.

	Year 1	Year 2	Year 3
Humanities	Farhad		Dariush
Engineering	Farokh	Ali Koorosh	Saeed Bizhan

TABLE 3.2: Year of study and discipline of the student interviewees

3.3.1.1. Case 1

Ali was in his second year of study at college D, and he was studying hydraulics, or more specifically, coastal engineering. He had successfully passed the Exam for Higher Education Abroad five years before he actually started his studies in England. This had made it difficult for him to start his studies here, because, as he said, he had changed since then. This problem is quite common for students coming from Iran, as there is a very long process to get through before actually starting one's studies abroad.

Another problem Ali had had before coming to the UK was that he was not from Tehran and he did not have access to the up to date information usually available to students from Tehran, as he put it.

In addition, the Iranian Ministry of Culture and Higher Education (MCHE) has certain policies for choosing institutions of higher education abroad. The MCHE only approves of institutions with an RAE (Research Assessment Exercise) rank of 5. In addition, the MCHE does not accept admissions from universities in cities in which the number of Iranian students is higher than a certain level. As a result there is often

little choice on the part of the students on the universities they want to study in. This is evident in the following quotation from Ali:

> I had another admission from the University of Manchester, which I think was very good but the MCHE did not accept it. So I came to college D because this was the only choice left for me and I had to use it anyhow.

He had thought of changing his college or city upon arrival and during the initial English Language classes, but he had decided that the best choice was to solve his problems in college D. He had come to this conclusion for two reasons: lack of enough knowledge of the English language, and fear of entering another city or university. He had changed his supervisor upon arrival at the college on the suggestion of fellow students. He said:

> When I came here, fellow students told me that my supervisor was not appropriate, and suggested that I change him. …And I went to see my ex-supervisor and told him that I wanted to change my topic….He said he didn`t do that area, and he added that there was another supervisor who did. This was what I wanted to hear.

His new supervisor had suggested two topics and had said that he had been particularly interested in one of them. The supervisor had asked him to consider which one interested him more, and to choose one of them:

> He then gave me two topics and said I could work on one of them. And he said he would suggest one of them in particular. And I accepted. …I wasn't at a level to reject or say I wanted to work on something else, or that I am interested in something else. I wasn't interested in any of them in particular [he laughs]. No interest and no background; so I followed what he said.

His supervisor had also helped him in areas other than the selection of a topic of study. He had showed him how to focus on a particular issue, and how to study as a

researcher. He remembered that his supervisor once gave him a book of about 500 pages and asked him to study and report on it the following session:

> He once gave me a 500-page book to study for the next session. Well, I thought oh my god, I have to read 100 pages a day to finish it. But he said he didn't want me to understand everything in it, but only to know what methodologies and formulas had been used.

At the start of his studies he had been studying a broad area consisting of many sub-areas. His supervisor had pointed out to him that he had to narrow down his area of study:

> There are different areas in coastal engineering, such as the ebb and flow tides, sedimentation, deltas….crosswise currents, etc. At the beginning of my studies I was spending a lot of time in all these areas. I studied one thing for a few days and studied another thing a few days later. …After a while my supervisor suggested that I should give up this sort of study. He said I wouldn't be able to do anything if I studied such a broad area. He said this tide stuff is a huge area by itself, and he suggested that I leave it out altogether.

Ali believed that because he had not had any background or interest in his topic, he had to accept whatever his supervisor said to him. This, he said, had changed him " into a person who had to accept whatever [his] supervisor told [him], since [he] had no experience or background in that area". This point was also mentioned in the interview with Dr.e1, one of the engineering supervisors, who claimed that most students chose topics not out of interest, but because of the funded nature of topics.

In addition, Ali felt that he was being marginalized in the team he was working in because of the funded nature of the project:

> I am actually not counted as a member of this team. And they don't want me to be considered one of them because of the funded nature of the project, you know.

His project was part of a funded project in which two other people were involved, in addition to his supervisor and him. He said that, although his supervisor had assigned him the topic, he himself decided which part of the project to work on. He had decided to work out a mathematical model on a set of equations to compare what the other members of the team had found. After having done this under the guidance of his supervisor, he was asked to work on something else. However, he still did not seem to be fully aware of why he had to go from one step to the next:

> They had done some fieldwork, and I thought there should be a mathematical model to compare them with. But they had nobody in their triad to do the mathematical model. And that's how I entered this line of research. Now it's exactly the case that my supervisor tells me what I've done is excellent and says, "write the results and put it aside. Our next move is so and so." Exactly like that. And he is [always] right. Now after one and a half years, I don't have the ability to see why we have to take "X" as our next move.

Ali further added that he knew of students who reached that level to understand the 'why' question raised above, or they could at least discuss such issues with their supervisors, but he believed that "[he had] not reached a level to discuss [these] things".

There were two other people in the team in which Ali was working. One of them was a post doc from England, with whom Ali had not been able to establish a working relationship. He explained this was because: *she* was a woman; she had her PhD and thought she was more experienced; she had certain temperaments that made her unapproachable even for the natives of England. Therefore, they did not have much direct contact with each other, although they were occasionally referred to one another through their supervisor.

There was another student who was jointly supervised by Ali's supervisor and someone else. This second student was a woman who was working part-time for a research institution. They had very good working relations with each other and often communicated through email:

> She has certain references there, which I can use, and I have done certain things here, which she can use. They have a programme similar to what I have run here. We compare our results with each other.

The sort of relation Ali had with this second student was a direct relationship, not through his supervisor, as was the case with the other student. They themselves decided how to use each other's findings:

> We help each other not because we feel we have to. There's no sense of obligation in that....But I don't have the same sort of relationship with the other lady. I go to my supervisor, and he refers me to her.

His conception of doing a PhD was that it had two purposes: first, to become a researcher, and second, to become an expert in a specific area. He said that he did not have the same idea about PhD at the beginning of his studies, and he had learned these from his supervisor:

> In our first meeting, my supervisor told me what he expected of a PhD student...He said he did not expect a PhD student to come here and finish his studies with a *full* mind, but with an *open* mind.

We will see later that Koorosh's supervisor, too, had made it explicit to him in their first meeting what he expected from a PhD student. As I will explain later, I did not find this level of explicitness in my interviews with the social science/humanities supervisors.

Ali usually reported to his supervisor orally on his experiments and activities. The only times he had had to write reports were when his supervisor or he was away on a trip. This situation leads us to reconsider Russell's (1991) argument that writing in the academic disciplines has taken on more importance than oral language. It seems that both written and spoken language are important in the communication between supervisors and students.

Ali's supervisor had told him that the project had to be finished in three years. He had also asked him to start writing his transfer report for his upgrade from MPhil to PhD at the end of his first year, and he was writing his transfer report at the time of the interview. He had learned from other students that his supervisor "only attended to grammatical problems, not to the whole thing" [he probably meant organisation].

One further point about his writing was that he said although his work was in the framework of a larger project, he himself was responsible for the writings.

3.3.1.2. Case 2

Saeed was at the end of his third year of study at College D. He was studying hydraulics and was sharing the same office with Ali. When I went for the interview he was in the middle of some experiments in the laboratory and he suggested doing the interview there. We went downstairs to a large laboratory full of different equipment. In one corner of the lab, there was special equipment on which he had been busy experimenting as part of his study. This consisted of a tank which contained water, a sort of slope tube made of glass in which water ran from the tank to a set of containers further down. There were also laser instruments for measuring the speed of water

flowing through the tube. There was nobody else in the laboratory, although one or two people passed though during the interview.

When Saeed had started his studies, other students had advised him not to propose a topic, but ask his supervisor for one:

> They had this experience that when a student proposes a topic, the supervisor may accept it. But if the project does not end up successfully, the supervisor would not assume any responsibility. The supervisor would say that you yourself had proposed that topic, you should have foreseen the shortcomings, you should have had a good background, and you should have foreseen where it would end. In order to avoid this situation, students often advise each other to choose topics proposed by supervisors.

Saeed mentioned two sources for PhD topics. He said that supervisors who are actively engaged in research often have a set of unanswered questions. "Supervisors", he said, "often assign these unanswered questions to their students." The next source for topics, according to him, was to consider the works of previous students:

> Or they [supervisors] suggest the works of their previous students, which are much better since there is a complete background from the previous student—his thesis and his investigations are available…Now the supervisor suggests such topics from previous students to the [new] student and says this student has gone this far. You can follow him, or you can work on a similar area.

As mentioned before, Saeed had asked his supervisor for a topic at the start of his studies. His supervisor had designed an instrument [a column overflow] for a private organisation before, and he had encountered some problems. Using his experience, he had managed to overcome the problems, but he had not managed to understand the reasons for those problems scientifically. This formed the topic for Saeed's PhD.

His supervisor, according to Saeed, was one of the best in designing, but he was not very good in theory, and he had stated from the beginning that he would not be able to offer much help to Saeed. However, he had helped Saeed in designing the instrument:

> …Although the idea was mine, but in the design of this [the instrument in front of us in the lab] he helped me a lot. He helped in the design of the model, in drawing the diagrams, in the way the model was going to be made, and in what elements it should have, etc.

He had very good personal relations with his supervisor, but he did not trust him scientifically. He did not trust himself either:

> …he couldn't say what I was doing was right or wrong. So at every stage he just agreed with whatever I said, not in the sense that it was correct, but in the sense that I had been working well. So this has been my problem from the beginning, because I don't trust him [scientifically] and I'm only a student, and I don't trust myself either [laughing]…

Saeed had very good relations with other students, especially with Iranian students in the college. He attributed this to the friendly atmosphere of the section in which he studied. He had also established working relationships with other staff in the department. This latter type of relation was particularly useful and important to him, in that he was using laser in his experiments, but he did not know much about it:

> Laser itself is a very complex issue. It is a physical issue, which we [I] don't know much about. We [I] know how to measure speed and other parameters with two rays of laser, but we [I] don't know how it works. And it is very time consuming to set up the laser instruments, or to process the data you have gathered.

His supervisor did not have any background in laser either. However, the head of the section in which he studied was an expert in laser and most of his students were somehow engaged with laser. Therefore, when Saeed decided to use laser in his experiments, he had to establish a close relationship with him. Although Saeed had to

wait for five or six months, the head of their section had finally helped him in setting up the laser instrument:

> …he helped me to set up the instrument, and he also asked another supervisor to come here to set up the instrument together. If they had not helped me, I would never have been able to do this.

He had been trained by one of the supervisors in the department in using the laser, and he often asked one of the students to assist him whenever he faced a problem. He also said that the technicians in the section had helped him in constructing the instrument.

He regarded his own case in having to use other's experiences an exception, and he thought that because PhD's are very specific lines of enquiry, nobody could be of much help to the student:

> But as you know, the essence of doing a PhD is such that everyone is working on their own project, and it's individual. Sometimes [the relation with other students] is more or less chatting about our projects, progress and problems. It's very rare that we cooperate with each other. My case was an exception…Mostly it's like working on a specific topic and we don't know much about each other's topics…

Saeed mentioned that one of the problems he had had upon starting his studies was unfamiliarity with computers. He said that Iranian students are usually less familiar with computers and they often seek assistance from other students:

> Students who come from Iran are relatively older than others and have less information than others [on computers]. And it's usually the case that students ask each other how to work with computers, and it was like this for me.

When I checked with him about the above quotation a few weeks later, he clarified the point further and said that engineering students coming from Iran are usually very good in computer programming, but not so much good at working with the internet.

Therefore, by lack of familiarity with computers, he, in fact, meant lack of familiarity with the Internet. He also mentioned his language difficulties at the start of his studies as a factor that had prevented him from communicating with his supervisor. He said he couldn't understand his supervisor, and neither could his supervisor understand him.

Saeed referred to four types of writing that students in their department usually engaged in. The first was the transfer report, which he had successfully written. He said his supervisor' comments on his upgrade report were solely on language and never on technical issues. In fact, Saeed said, his supervisor had rewritten many parts of the transfer report himself:

> His comments were solely on language. This is again one of his shortcomings in that he never comments on scientific aspects. He never says if something is correct, incorrect, or what. He says, "What are you trying to say? Explain that to me and I will write it for you in correct English." Or he corrects what I have written myself. ... and consequently he rewrites all that I've written; he infers from my writing what I want to say and writes it from the beginning.

When I asked how he had found out how to write the transfer report, he said he had attended a writing class in the school, which he thought had been very useful. He had also examined reports by previous students and had modelled his own on them. Then he had written a table of contents in advance and had filled in the slots gradually.

Saeed had written one or two six monthly reports, which were required according to the school regulations, but his supervisor had not read them. Consequently, he had given up writing these reports. He also wrote memos during his experiments to record his observations, difficulties, or some of the results that could be used in his writing later on. But he never gave these to his supervisor. He only gave oral reports on his

activities to his supervisor. Saeed believed that doing a PhD would teach one how to think and how to start working on something one does not have any idea about, and then reach a conclusion.

3.3.1.3. Case 3

Farokh was studying computer science at College D. He was at the end of his first year of studies. He had not had to attend language courses, as his IELTS score was 7.0. However, he had attended a special program on academic writing. He had been assigned a topic by his supervisor upon arrival:

> When I met my supervisor, he had the topic...so it wasn't the case that I had a topic beforehand. In fact, my supervisor had a bigger project that he had divided into smaller projects and he had assigned each of his students to do one of them. So there's been no decision on my part. The project had been decided upon before my coming to here.

However, he did not know from the beginning that the project he had been assigned was part of a bigger project, and he came to know that quite by accident:

> In fact, I came to know that my project was part of a bigger project quite by accident. There was a question in the form I had to fill out and send to my sponsor to the effect if the school had approved of my project. When I asked my supervisor, he explained that this was a big project that had been approved , and there was no need to get its sub-sections approved as well.

He seemed not to be satisfied with his supervision process. He said his supervisor had assigned him the topic, but there had been no help on the methodology he wanted to use. He had written some reports to his supervisor, but he was not satisfied with the way these had been handled. He expected comments from his supervisor. but he had not received any. When I asked him what type of comments he received from his supervisor, he answered:

> Nothing. Absolutely nothing, and I doubt if [he] read them in the first place. At most [he] might have turned over the pages. There have been absolutely no corrections at technical or grammatical levels.

Farokh was not satisfied with the types of activities proposed by his supervisor. His research was on the construction of a new type of 'chip', but he thought his supervisor usually asked him to engage in irrelevant activities:

> He sends me after another *black pea*[1] ...These *black peas* don't help much in my thesis. ...Studying electrical machines is very interesting by itself, but it won't help me in designing a telecommunication switch.

Although Farokh was working on a small part of a larger project, he had very little contact with other students doing other parts of the project. He had only met a Korean, who was working as a post doctorate student for the college, by the advice of his supervisor:

> There is a Korean guy who has his PhD, and he's been working for the college for a year now. And it happens that he wants to go back home. So my supervisor asked me to go and see him and see what he's done.

He even did not seem to have a clear picture about the overall framework of the *big* project.

He had written a report to the graduate tutor at the school, who was presumably responsible for the progress of students. This report, he said, did not have to be very technical, but only on the activities the student had been engaged in during the previous six months, and what they planned to do over the following six months.

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[1] "To send someone after black peas" is an idiom in Farsi, roughly meaning "to make someone chase his own tail".

He had also attended writing classes in which he had written some scientific diaries, in the sense that he had written what academic activities he had been engaged in for a certain period of time.

Farokh had certain conceptions about the purpose of doing a PhD. He thought that a PhD is necessary in order to maintain one's job in the university. He also believed that the mere title of PhD influences one's students and makes them learn better. Farokh believed that the PhD course is a good opportunity to refresh one's academic capabilities and learn more.

Farokh had a strong belief that the way PhD is handled in the UK is irrelevant to the needs of his home country. In fact he thought he was wasting a lot of money for nothing:

> I am not at all satisfied with the system here. [Laughing] I think I'm wasting the State's money. I don't think I've learned much...

He reiterated the same idea elsewhere:

> I myself haven't learned much during these ten months being here. If somebody asked me what I've done during these ten months...while spending about £20,000 of the state's money [on tuition fees and scholarship], I'd hardly have anything to say, and I'd have to say, with shame, *nothing*.

He concluded that there should be special programs for *PhDs in teaching,* so that the Iranian Ministry of Culture and Higher Education (MCHE) requires students who are sent abroad to specialise in a specific field they are going to teach when they go back home. He suggested that what I [the interviewer] was doing was pointless and it wouldn't be of any use when I go back to Iran:

Sometimes I think a sort of PhD in teaching would be much better. So if you [pointing at me] want to teach grammar and linguistics, the MCHE will tell you that you're going to teach these ten subjects after coming back to Iran. So you go and study how to teach these ten subjects. In other words, the student becomes an expert in teaching certain subjects. ...Take yourself. You do all this interviewing, transcribe it, and since you'll be able to gather at most 50 interviews, so you'll have limited data, and presumably no random sampling was carried out. So how far can your findings be generalised?

The above comment suggests Farokh's positivistic inclination.

3.3.1.4. Case 4

Koorosh, too, was studying at College D, and he was half through his second year. He was studying rock mechanics, which is a branch of mining engineering. He shared a large room of about 30 square meters with five or six other students. When I went to see him, he had just come back from a meeting with his supervisor to discuss his upgrade. He was going to take his transfer examination the following week, and was a bit worried about it. He told me that a student from China who had been in the college for three years had failed the examination for two or three times. When I contacted him a few days later, I found out he had passed the exam.

Koorosh's supervisor had advised him to study one of the areas for further research he had mentioned in his own thesis:

> It's natural that each supervisor writes a section on areas for further research. My supervisor was no exception, and he assigned these areas to his students.

Koorosh's supervisor had drawn a graph in their first meeting showing metaphorically his own level of knowledge at a higher level than Koorosh's level of knowledge. He had told him that when Koorosh's level of knowledge surpassed his own level of

knowledge, Koorosh would be qualified for a PhD. As we saw in Case 1. Ali's supervisor, too, had explicated what he expected from him very early in his studies.

Koorosh recalled that he used to meet his supervisor more often at the beginning of his studies, but both the quality and the quantity of the meetings had changed over time:

> We decided to meet regularly, at least once a week. ... We had more meetings at the beginning, especially during the first year. Then he told me that I should reach a level where he could give me more independence little by little,... So now after one and a half years we still have meetings, but it's no longer that he tells me what to do, rather I report to him what I've done.

In the section on interviews with supervisors, we will see that supervisors quite often follow this 'scaffolding' procedure in their supervision practice.

The way Koorosh conceived of supervisors is interesting in that he believed that a good supervisor is like a "father":

> A good supervisor is like a father. I think a good supervisor should pay attention to the student both in terms of his studies and other aspects as well. Although our personal problems do not have to do with our supervisor, they have to do with our studies. So if we have personal problems, they will affect our studies.

Koorosh was working on a project assigned by his supervisor. This project was related to projects being carried on by three other students. However, it seemed that he did not have working relationships with all the members in this team:

> There are four in our team. One of us works at home and never comes to college, so we rarely have any contact. There's another student who has just recently begun, and he doesn't have much to share, but he comes to me a lot and asks me about my work in certain areas. There's another student from Korea who's very intelligent. I had much contact with him before, but because he isn't sociable, we don't have much contact now.

He had found out that it is not always possible to contact other students easily. He attributed this to "nationalities and personalities" of other students: "sometimes if you go to a student to ask questions, he may get annoyed".

His supervisor had not suggested when he should write his transfer report. In fact, he had told Koorosh that if he did not know when to write the transfer report, it meant he was not ready to write it yet.

Koorosh had started writing the transfer report eight months after he had started his studies. He had prepared an outline and after his supervisor had approved it, he had started writing. The process he had followed was very similar to that of Saeed in that he had prepared an outline (Saeed's table of content) and had filled in the slots:

> And I prepared an outline and wrote that I was going to include these five chapters in it…Then I gathered the material and put them into the boxes I had identified…

Then he had written a first draft and revised it later on.

One interesting point was that he had this feeling that sentences used in the articles he had read had to be used in his own writing:

> In writing the chapters I often made use of the sentences in the articles I had read, but slightly paraphrased them.

His supervisor often clarified some points in Koorosh's writings or corrected some minor errors, but he never changed the overall format of the writing.

3.3.1.5. Case 5

Bizhan was in his third year at College A, studying telecommunications. He was working in an office of about 20 square meters. This was shared with 3 other students and a post doctorate researcher from Iran. His supervisor was an Iranian, whose office was next door. He had started as an extramural[2] student, but when he had come the previous year for the third time to England, his supervisor had advised him to stay until the end of his studies.

When he had first started his studies here, his supervisor and another of his students were working on a project:

> When I first started my studies, my supervisor was writing a paper. It was a project on one-dimensional noise signals. The system he was working on was sensitive to noise. He was trying to find a mathematical explanation for this sensitivity. And he asked me to find one. Thus I started my studies. In fact I had no prior plan before coming here. …I worked out [the mathematical model] and the paper was published.

After this initiation into that teamwork, his supervisor had suggested that he work on a two-dimensional model of the first project for his PhD. Contrary to the first project, his own PhD was individual.

Bizhan's supervisor was an Iranian. He had helped Bizhan in topic selection, but he had not told him what method to follow. According to Bizhan, his supervisor knew which method was *fashionable*. He had told Bizhan that his topic (a method for data compression) was good, and Bizhan could see that a paper was being published on that at least every two or three months.

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[2] These are students who are jointly supervised by a supervisor from a university in Iran and another from a university abroad. They spend three months each year abroad and the rest of the year in Iran.

His supervisor also acted as a medium every now and then to refer students to each other. Bizhan remembered that his supervisor had sent another student to him for certain information.

Bizhan had friendly relations with other students in the room. He had once needed programming, and he had gone to the Iranian post doctorate student working in the same room for help. When prompted to explain how he had found out whom to go to, he answered, "it's easy to know who's good at what". This, i.e. knowing who is good at what, is one of the components of learning in communities of practice (Wenger 1998, p. 95), as discussed in *Chapter Two*.

He had first started his studies by taking part in the development of a paper, as I mentioned before. His supervisor had written the first draft, and the other student in the group did the revisions requested by journal reviewers. He had contributed 4 or 5 pages to the paper.

He had had presentations in four conferences. He had also sent a paper to a journal and was waiting for their reply.

When he wanted to write his MPhil report, his supervisor gave him some models from previous students to examine.

He was thinking of his dissertation as a set of articles compiled in one volume. Therefore, he was mainly working on papers:

> [My thesis] will include my MPhil report, which was about 30-40 pages. And since I am mainly working on papers, I will write the dissertation later. In fact I work on several papers on the same topic, but they are different in their

> mathematical models. So I think each of these papers will form a chapter in my dissertation.

3.3.1.6. Case 6

Dariush was an extramural student[3] at College C, studying history. He was a lecturer in a university in Tehran, Iran, and he had ten years experience of teaching.

After finishing an English course, he had gone to visit his two supervisors. The first question they had asked him was, "What is the *big* question in your research?"

> For me, my research question was clear. I explained the big question and the subsidiary questions.

One week after their first meeting, his supervisors asked him to write in greater detail on his topic. He prepared a piece of writing in about three pages, and the next time they met they modified his questions:

> My main question remained almost untouched. But because they believed that my research was too broad, they narrowed down the focus of my study. For example, when I was explaining my peripheral questions, they'd say, "Leave it". In fact the topic remained the same, but it was modified.

During his first visit, he stayed in the city in which his university was. After he saw all the documents available there, he had to move to London to examine the documents in libraries there. He had spent most of his time in the British Library and the Senate House during his last visit last year, and was doing the same this year.

After each visit, he would go back to Iran to write one or two chapters of his dissertation. Then he would send them to his supervisors immediately before or after

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[3] Refer to Footnote 3

his next visit, and they wrote their comments on it and returned it to him. Dariush had email contact with his supervisors when he was in Iran, and he usually sent them reports on his progress.

He had no contact with other students, and his research was a purely individual enterprise. This was no surprise as he only spent three or four months each year in the UK, studying and taking notes mainly in libraries. Moreover, he spent the rest of each year back home, working as a lecturer in a university, and trying to work on the documents he had gathered in England at the same time.

3.3.1.7. Case 7

Farhad was a student at College B studying education. He had changed his topic within a few weeks after the start of his studies, and as a result, he had changed his supervisor, since his previous supervisor did not work on the new topic he had chosen. In fact he had two supervisors, one of whom he met almost every two weeks, and the other he met every three months. He had a feeling that his supervisors had somehow divided their responsibilities with regard to him. The first supervisor usually commented on linguistic aspects, and the second on concepts. He had once asked his first supervisor why he never commented on concepts, to which he had answered, "because you have not made any claims yet". He had received a similar comment from his second supervisor:

> He told me that I am a PhD student and I'm one step away from a PhD holder. So a PhD student should present his own ideas. [He added that] it's not enough to say [X] has said this, [Y] has said that. I should also say what I say.

He had found a very different academic atmosphere and expectation in his college:

> I feel there's a difference between the [academic community] we were in back in Iran, and the one in here. The one in Iran was more in side with positivism and quantitative data collection. …and I think when we go back to Iran and say we were using qualitative techniques such as interviews and observations, this might seem strange.

Although he had chosen his topic himself, his supervisors had helped him in fixing his research questions. He remembered that his second supervisor had asked him to modify a model he had developed for his research. He modified the model before they met the next time, but his supervisor did not seem to be completely satisfied:

> So he suggested that we sort out the things together in that session. So we discussed things for about an hour, and he separated the two parts of the model. …and he also changed the language of the questions. He reduced the number of the questions from six to four, but they had the same content.

At first Farhad was only thinking of text analysis as his research tool, but his supervisor added observation and interview as two other tools that were essential to his study.

He had very friendly relations with other students in the department, especially with a handful of students who were using the research students' room. However, since he believed that the PhD is very much an individual enterprise, he thought comments from other students are not very reliable. He believed that other students' comments could be useful only in certain areas:

> For example, many times I've heard from [other students] that so and so book can be found in so and so place. …Or about using computers. I didn't know anything about computers the first day I came here, and I asked other students and learned from them. But comments on what to do in one's research and what not to do are not reliable.

3.3.1.8. A Summary of the Findings of the Seven Interviews Described Above

As I explained in the introduction to this chapter, one reason for presenting this chapter in this way is to reflect the grounded nature of my approach. Although I coded interviews one after another, there was a time lag between the initial seven interviews I have presented so far and the rest of the interviews. At this stage of the research, some core variables had emerged, and the following interviews focussed particularly on these. This is why I present a summary of the findings of this phase of the research before elaborating on more cases.

In the seven interviews that I carried out in this phase of the research, I found certain variables that were repeated more or less for many of the participants, such as 'relationships between supervisors and students', 'funding', 'epistemologies in different fields of study', 'cooperation or lack of it', etc. I should say that after each of the interviews I further polished my initial understandings of the situation under study, reformulated my research questions, and asked more focal questions in the succeeding interviews. Nevertheless, there were issues that still needed more clarification. For instance, I still did not know the point of view of these students' supervisors concerning the issues raised in the interviews. That was why I decided to do interviews with some other students, and also some of their supervisors. In the following section, I will present an account of the interviews I conducted in the following phase of the study. But before that I should also mention that the last interview I did was with an engineering student whom I refer to as Shahab. As the findings of this interview were more or less congruent with the previous interviews, I will not present a separate section on it.

One of the initial themes I encountered in my interviews was the practice of supervisors assigning topics to their students. I will come back to this later in *Chapter 7*, but for the time being it seems useful to present a table of all the students I interviewed, categorised by their field of study and their status of topic assignment:

Name	Field of study	Assignment
Saeed	Engineering	+
Ali	Engineering	+
Bizhan	Engineering	+
Farokh	Engineering	+
Koorosh	Engineering	+
Shahram	Engineering	+
Shahab	Engineering	+
Armin	Engineering	_
Reza	Social science/humanities	_
Dariush	Social science/humanities	_
Farhad	Social science/humanities	_
Babak	Social science/humanities	_
Hamid	Social science/humanities	_

TABLE 3.3. Students under study categorised based on their field of study and their topic assignment status

3.3.1.9. Case 8

Hamid and I were in the same airplane when we first came to England. Then he could not speak English at all, and he had had to take a six months course in English upon

arrival. After this initial period of attending English classes, he was now working on a proposal, but when I examined the three-page proposal he had written, I could see that he still had lots of linguistic errors in his writing.

He was in his second year of studies in College E, studying Ancient Cultures and Languages. His research was about the development of the verb system in Balochi, which is one of the Iranian Languages spoken in southeastern Iran and some western parts of Pakistan. In other words, his study could be regarded as within diachronic linguistics studies.

This choice he had made in his topic was an informed one, in the sense that when he was still in Iran, an ex-student of his present supervisor had told him about areas this supervisor was interested in. He had subsequently decided that if he were to receive an admission, he had to choose something within the range of interests of this supervisor, although it was not what he himself was interested in:

> … before I had seen that previous student of my supervisor, and before coming here, my main areas of interest were mythology and religion, or more specifically the religions of Old Iran. Because, my course of study is Ancient Cultures and Religions, and culture also includes religion. In fact I wanted to work in that area, but that ex-student told me that [this supervisor] was more interested in the philology, syntax, inflection, etc. of Iranian languages.

Hamid had also received some background about the PhD system in the UK, and more specifically about College E, where he was now studying.

Before coming to England, he had sent his supervisor a proposal. He had suggested comparing and contrasting all aspect of Middle Balochi with all aspects of Middle Sogdian. This proposal, however, was too broad and his supervisor had suggested that

he narrow it down and focus on the verb system of Middle Balochi and other Middle Iranian Languages.

He knew that his supervisor had two other PhD students, one of whom he had never met. Nevertheless, he seemed to be on friendly terms with the other student, who was from the Parsians of India, and they often talked to each other about their projects. Hamid had learned many things about the 'methods and behaviours' of his supervisor from this student. He also believed that the topic of PhD should be something of interest to both the student and the supervisor

Hamid received feedback from his supervisor on spelling, grammar, and also references he used in his writing. He had once referred to an Iranian researcher in his report, but his supervisor had suggested that he should try to use more prominent and well-known authorities in the field. Hamid had also received other comments on the use of references:

> …let me start by saying that we are used to giving references for very basic issues. For instance, everyone knows that Lori, Kurdish, Balochi, etc., are among the Iranian family of languages. However, since politics is quite mixed with linguistics in Iran, in Iran we usually say that Balochi is one of the Iranian languages according to so and so linguist. Now my supervisor says this is crystal clear, you don't have to give references in such instances.

I conclude this part by some general comments. Hamid attended the school only two days a week, which is in sharp contrast with what I found with the engineering students I studied. And he believed that books are more useful to his study than journal articles. He was doing the PhD only for the title, and he thought there was nothing that he could learn in this course.

3.3.1.10. Case 9

Reza was studying anthropology in College E, and he was in his second year. At the start of his studies he had attended a six-month English Language course. He was upgraded after about eight months from the start of his PhD course. However, he was not required to include any data in his upgrade report, and it only included a review of related literature.

Before coming to England, he had met a visiting professor from one of London Universities in Tehran and had talked to him about his plan to study in the UK. Reza had received a lot of ideas about College E and his supervisor through this visiting professor, who was also familiar with Reza's would-be supervisor. Back in England, this visiting supervisor had contacted Reza's would-be supervisor and had talked to him about Reza. Therefore, when Reza had arrived in England, both he and his supervisor had some background about each other.

Reza had sent his supervisor a proposal when he was still in Iran. However, during his six month Language course he had found out that the topic he had chosen required some journeys to Iran and some other Islamic countries. To make it worse it was not quite compatible with his supervisor's areas of interest. As a result he had written a second proposal after the language course was over.

This second topic was somehow related to Iranian tribes, which was among the main interests of his supervisor. Nevertheless, after working on this topic for about two months, Reza had realised that this required some prolonged fieldwork among some Iranian tribes. This was not possible for him to do for two reasons. First, as he put it, it

is against the Iranian law to collect first hand information in social sciences and humanities in Iran and transfer them to other countries. And second it is against the regulations of the MCHE (Ministry of Culture and Higher Education) that students spend more than one month in Iran during the course of their studies.

As a result, Reza had abandoned this second topic after two months, and he was currently working on a topic that was not 100% compatible with his supervisor's interests:

> [After I chose this third topic] He told me, "Ok if you like this, no problem, you can do this. But don't expect of me that I can help you like the other one. Because in this area I'm not a specialist in very strict sense of the term". But however, he has field studied Iranian anthropology, And also he is quite familiar with contemporary history of Iran. So he knows several things about my topic but not as much as the other one[4].

However, he received a lot of helpful comments on the writings he handed to his supervisor. These comments included all aspects of language and specifically spelling. As Reza said, spelling was quite important in his work, since he had to use a lot of Farsi words in his writing, and Farsi words should be written in a special way in the Latin alphabet. He also received comments on the proper anthropological style of writing:

> The third point is he sometime also gives me very good comments about the rhetoric of my style. He says, " Ok this is grammatically correct, and you can use this, no problem. But in English there is this expression and in anthropology we usually use this and it's better".

Reza often attended two weekly seminars held in his college. One of these seminars was for students to exchange their ideas and problems with each other, and the other

[4] This is the only interview with students that was conducted in English. I have done little to correct the language.

was one in which one of the professors would give a lecture on an issue related to anthropology.

He had asked one of the senior students to proofread his writings once or twice, and he had also learned how to work with computers from other students. He often went to college two days a week, and he said he found articles more important than books.

3.3.1.11. Case 10

Babak, too, was in College E, studying art. He was in his first year of studies and was among the few Iranian students who had been sent abroad to do a PhD in this field. In fact, as he said, there are very few art PhD holders in Iran, and many of them are graduates of French universities. This was because, according to Babak, Iran has mostly followed France in arts and cultural issues, specifically in art education.

He had gone through a lot of difficulties getting an admission from UK universities. All his applications had been rejected, until he had finally managed to get an admission from College E. His success in getting this latter admission had been partly due to his growing expertise in writing proposals. He had observed that UK universities were very particular about proposals, and they wanted him to specify exactly what he wanted to do. He had talked with an industrial engineering student in Iran, who, to his surprise, had told him that getting admissions was the easiest part of the process.

In his last attempt to get an admission, which was the only successful one, he had written a proposal on The Imaginary Arts in Shah-Tahmaspi Shahnameh. He himself

was more interested in the contemporary art of Iran, but he had chosen this topic, since he assumed that people in the west are not familiar with the contemporary arts of Iran. To his great surprise, he had received an email from his present supervisor after a month:

> Then quite unexpectedly I received an email from my present supervisor, saying that the topic is quite interesting but not workable… she had suggested that there was nothing original in my proposal, and she had said I would not be able to go round the world to find all the pages of this particular Shahnameh. She had suggested that I either work on other Shahnamehs, or on contemporary issues.

Babak was very delighted that his would-be supervisor was interested in the contemporary art of Iran because, as I mentioned before, this was his main interest. Following his supervisor's request, he had written another proposal of about three thousand words on a contemporary topic and sent it to his supervisor. After reading this detailed proposal, his supervisor had accepted to send him an admission.

Babak was initially disappointed after he started his studies. This disappointment stemmed from that he thought he knew what he was going to do before he actually started his studies, but he had suddenly found out that he no longer had any idea of what he wanted to do. He even did not have any clear idea about his research questions.

In the first meeting he had with his supervisor, she had suggested that he bring her his material, which consisted of a set of images he had brought with him from Iran. At the end of that session, she had asked Babak to prepare a list of the chapters he intended to include in his thesis and take it to their following session. In their third meeting, his supervisor had modified the titles of the chapters:

> I wrote a list of the thesis chapters and took it to the next meeting, and she gave me very good comments. For instance she suggested that I include the effect of the revolution, the role of women, etc on the contemporary Iranian art. And she asked me to include her suggestions in my list of chapters and bring her a revised version within two or three days.

As Babak did not have a very clear idea about his research questions, he had talked to his language tutor, who happened to be a senior PhD art student herself. She had suggested that Babak write all questions that came into his mind and take them along with him to his supervisor. Therefore, in the next meeting he had with his supervisor, he handed her a modified list of the chapters and a list of research questions:

> In my fourth meeting with my supervisor, she commented on the questions I had written, accepted some of them, and deleted some issues I had mentioned. And she also commented on the list of chapters I had written, and modified the order of the chapters. And she also modified the title of my PhD project.

Subsequently, he had started to write the first chapter, although he was still not clear about his research questions. This chapter, as he said, was only a historical narrative, and he had written ten pages of it at the time of the interview. The procedure he had used to write these ten pages is worth mentioning here:

> Well, I read the books my supervisor had suggested, and I copied or took notes of the parts I needed. Then I put these notes in a file. I wrote down the references of each of these notes at the bottom of each note. I called this file chapter one, and I worked on these notes and decided where to put each note, whether in the introduction or in the body, etc. I also translated the Farsi references I had, and I had the Language tutor to have a look at them, and I compiled all these in the text. I used some of these notes as direct quotes, paraphrased some, and summarised others. There were also plates (figures) that I used in the text. It was very difficult to match these to one another. And it is not still well written. I had around 20 pages [at the beginning], but I wrote 10 pages out of this file [at the end].

Babak often attended the MA courses of his supervisor, and he tried to find out what her conceptions and ideas were regarding academic issues. He knew one Iranian

student in his College who was studying architecture. They sometimes talked to each other about their studies. And one final remark, he said there were very few references in his field of study. In addition, he believed that books are more useful than journal articles.

3.3.1.12. Case 11

Shahram had started his studies in College D three months before my interview with him. He had not had to attend language courses, as his IELTS score was 7.0. He was studying computer sciences. He had received an admission from this college three years before he actually started his studies. However, because of the red tape, he had not managed to start his studies on time. Finally, when he had managed to solve his problems back home to come for his studies, he had a terrible accident and was hospitalised for three or four months. After he recovered, he tried to renew his admission, but the professor had already taken too many students, and he had referred him to another supervisor. He was now working with this second supervisor. He had agreed on a topic with the first supervisor when he was still in Iran:

> I remember that Professor X asked me to read his web page and asked if I was interested in his areas of interest—this is, I think the policies of supervisors. And I answered that I was interested in those areas. Then he sent me three articles [written by himself] and asked if I was interested in them, and again I answered yes.

However, after the accident when he had to change the supervisor, he also had to change the topic to suit his new supervisor. In fact he had asked them to jointly supervise him in order to avoid the bureaucratic procedures back home, and they had accepted.

His new supervisor, likewise, had suggested three alternatives for a topic: to work on a topic she had suggested, to visit her web page and choose another topic within her areas of interest, or to propose something else other than the first two, as she had suggested that she was interested in other areas as well. Shahram had accepted to work on something that was among the areas of interest of his supervisor, and on which she had written a paper.

After coming to England, Shahram had tried to modify the topic to make it closer to his own interest. His supervisor had accepted at first, but Shahram had realised that it was more complex than what he had been thinking:

> Then I found out that she had superficially accepted, and [I have found out that] when I went on a little bit and she saw she was not proficient in that, she tried to resist it, and tried to make me work in her own framework of interest. This is limitation. So at the end of the day, no matter how much I tried to find something of my own interest, I had to go back to the initial topic and work on that one single article my supervisor has on that topic. And now after these three months I have found out that this is the only way out, and if I go for other topics, I only make it hard for myself. So, unfortunately, I had to accept what my supervisor wanted.

Shahram was working on artificial intelligence. As he explained, there have been two trends in this field: an old one which used to be in fashion 15 or 20 years before, and a new trend. College D was among the pioneers of the old trend, but according to Shahram, it was now realised that the new trend that was originated in the US was more promising. However, it seemed that the staff in College D did not want to accept that their ideas were wrong. Therefore, as soon as Shahram said something that reflected the new trend—such as *learning* or *fuzzy theory*—, they rejected it. In one instance, his supervisor was greatly annoyed and had said she could no longer supervise him:

I suggested that 'learning' is good in this area, but she behaved in a way that I thought I had said something very foolish, or that what I had said was totally wrong. So I could see she was not interested. And as another example, I insisted on an idea once, me saying it works and she saying it doesn't. So we had a discussion, and my supervisor even called in one of her previous students to join the discussion. And they both saying it doesn't work and me saying it does. At the end my supervisor was very angry and said she could no longer supervise me because, as she put it, although she had not worked on that issue, she believed I was going astray. And she went to the postgraduate tutor and told her that she couldn't supervise me.

He had tried to find another supervisor but with no success, and he had to go back to his supervisor again, working on the same topic she had suggested.

Shahram often met his supervisor, and reported on the papers he had read. He wrote his reports, but his supervisor rarely read them. One problem with these meetings was that she "talked more than she listened". However, Shahram believed that if she wanted to provide him with proper supervision, she should first listen to him and then speak.

Shahram had written some of his own ideas in one of these reports, but his supervisor had not given them as much consideration as Shahram had expected:

> In sum, I have found out that, as I have to spend two or three years here to do my PhD, so I cannot defy them and say I want to work on what I want. So I have to work on exactly what my supervisor is interested in and filter my own thoughts, or put it this way, I have to disregard those ideas of mine that I know she would not be interested in.

In addition to these problems with his supervisor, Shahram's expectations about studying abroad had not been met:

> Back in Iran, I had the same problem, as there was no database there and I had to do the simulations myself. I thought when I go abroad, it would be very good,

> a paradise, and I would be able to do these things easily. After I came here I found out this is not the case.

He did not have any contact with other students in the college, but he thought he would have to work in collaboration with others at some point in the future.

At the end of this section, I will briefly refer to two issues. Shahram believed that books are only useful in getting a general idea about something. However, journal articles comprised 100% of references in their field. And last but not least, Shahram had a very interesting idea on why he was doing a PhD:

> I should say I have changed my mind to a great extent ever since I started my studies here. Before that I thought that the purpose of doing a PhD was to do something grand, to make a revolution in a field. I was too ambitious, and I think I was wrong. That was why I didn't do my PhD in Iran, as I thought there were not enough facilities in Iran, and I came here. I was 100% against those who believed one should study for a certificate. Then after I came here, I was a little bit disappointed. I feel I am working on something other people are interested in. So my main purpose for the time being is to get the certificate in order to set myself free from my supervisor, and then go and work on something I am interested in myself.

3.3.1.13. Case 12

Armin was the only non-assigned engineering student I interviewed and showed features that were not common with other engineering students under study. He was studying mechanics, and more specifically naval architecture in College F. He had come from Iran with a definite idea of what he was going to do. Upon arrival, he had found out that his supervisor wanted to redirect him to his own areas of interest, which he had rejected. This had made him lose his supervisor and he had had to find another supervisor. This new supervisor had accepted to supervise him on what he wanted to do jointly with a second supervisor.

Armin had worked on his project for one and a half years, doing experiments and coming up with good results. It was at this point that he decided to take a break and go back to Iran for a holiday upon the suggestion of his supervisor. After coming back from Iran, he had found out that his supervisor, being diagnosed with cancer, had undergone an operation, and as a result had been paralysed. It was a catastrophe as it were, but what made it even harder for Armin was that he had to find a new supervisor, as his supervisor was not able to work anymore. After going through a lot of difficulty, the graduate tutor of the school had accepted to supervise him. He had been very helpful in providing him with the facilities he required for his experiments, but he wasn't able to offer him very technical advice, as this was not among his areas of interest. To cut a long story short, he had not finished his PhD after seven years. As I will explain in *Chapter 7*, I regard Armin as a boundary case in that he did not seem to have fully realised the norms and expectations of his discipline.

3.4. Interviews with Supervisors

I hope I have managed, to some degree, to show the care I took to work with the data. As I mentioned earlier, I worked with the interviews with the supervisors at a higher level of abstraction because by the time I was analysing these, certain categories had emerged that made it unnecessary to engage in 'open coding'. Rather I was doing 'selective coding', which "means to cease open coding and to delimit coding to only those variables that relate to the core variable, in sufficiently significant ways to be used in a parsimonious theory" (Glaser 1992, p. 75). I will leave a more elaborate account of these for the next chapter and presume that I have achieved to a moderate degree the objective of this chapter, namely showing how I organised a messy set of data into hierarchies. In the present section, I will present an account of the interview

data with the six supervisors participating in the study. This will be qualitatively different than the previous section on the students, in that it will be, I argue, at a higher level of abstraction. This is because by the time I started to interview the supervisors, I had already found some themes in the interviews with the students, which I could use to lead me to the next phase of interviewing the supervisors. This is again an attempt to show the process of the research which is based on grounded theory, and which shows a constant reflexive methodological dimension to doing my PhD.

In the interviews I had with the PhD students under study, several themes emerged. These were either related to the theoretical models explained in *Chapter 2* or emerged from the data itself. For instance, it was seen that there were complex relationships in the working spaces of engineering students, and it was also observed that the engineering supervisors often assigned research topics to their students. There were also differences in the way these students conceived of their supervisors. Therefore, in order to get a balanced picture, I decided to do some interviews with the supervisors of these students. My purposes in doing the interviews with supervisors were to:

1. know what they think knowledge is,
2. find out what they think the purpose of doing a PhD is,
3. understand how they think knowledge can be transferred to PhD students,
4. find out what they think about the assignment of topics to students,
5. see how and why, they refer students to one another,
6. find out what they think about the writing practices of PhD students and what type of support they provide to them.

I should also add that I tried to make the interviews semi-structured, so as to allow for more voice and ideas coming from the interviewees. Overall, I interviewed six supervisors, four from the engineering fields, and two from the social

science/humanities. The interview with one of the social science/humanities supervisors was conducted before interviewing the students, and the interviews with the rest of the supervisors were conducted after the interviews with the students. The first interview I conducted with the social science/humanities supervisor was intended to improve my skill of interviewing as well as generate some ideas for later interviews. Nevertheless, when I examined it again, I found that most of the questions asked were similar in all the interviews, and most of the themes were comparable. Hence I decided to include it in my account.

After having conducted the interviews, which took between 25 and 35 minutes, I transcribed them in full and coded them on the basis of the themes suggested by the theoretical models, themes suggested by interviews with students, and themes emerging during the course of the coding process. For instance, *mutual engagement* and *epistemologies* were among the main theoretical issues raised in *Chapter Two*. Therefore, when I came across an idea in the transcribed interview that suggested either of these themes, I recorded it in the margins of the transcript and underlined the word(s) that suggested these themes. I also came across themes that were not among those framed by the theories, such as *funding,* which I handled in the same way. Then I entered the coded data into QSR.NUDIST. I will briefly refer to the themes suggested in the interviews with these supervisors and coded using NUDIST below, and will leave a more analytical account of these for the remaining chapters. The themes I found in the interviews with these supervisors were as follows:

1. Assignment: all the four engineering supervisors assigned PhD topics to their students, while none of the two social science/humanities supervisors did so. I will come back to this in *Chapter 7*.
2. Initiation: The supervisors in the engineering fields seemed to be following certain models of initiating novice PhD students into their discourse communities, which were in many respects similar to each other and at the same time in line with apprenticeship and scaffolding models discussed in *Chapter 2*.
3. Purposes for doing a PhD: the engineering supervisors had often a more pragmatic stance with regard to doing a PhD, whereas the social science/humanities supervisors often had an idealistic view on this. Dr.e4, the fourth engineering supervisor, however, was different from the other engineering supervisors and similar to the social science/humanities supervisors. That is why I have considered her as a boundary case. I will give an account of this in *Chapter 6* and *Chapter 7*.
4. Mutual Engagement: Engineering supervisors were often more eager to have their students work together, although they sometimes found it difficult to do so.
5. From Dependency to Independence: The supervisors often followed strategies that were congruent with the concept of 'legitimate peripheral participation' (Lave and Wenger 1991) and 'scaffolding' discussed in detail in *Chapter 2*. The LPP was realised differently in the fields of the social sciences and engineering. In the former, it was mostly realised in providing feedback to the writings of the students, and in the latter it was realised in the assignment of easy tasks followed by the assignment of the PhD topic.
6. Publish or Perish: as one of the engineering supervisors mentioned, production of knowledge in the form of scholarly articles was of great importance to academic

life. This theme was also emphasised by one of the social science/humanities supervisors.

7. Money Talks: One of the important features in engineering was the funded research of supervisors. Supervisors often had funds available to them to do research and they often had their PhD students engage in such projects. This was directly related to the practice of topic assignment in engineering.
8. Social or Hermit: some supervisors were concerned that some of their PhD students were so involved in their studies that they forgot they were social beings that needed to interact with others and enjoy their lives as well.

3.5. Conclusion

The purpose of this chapter has been to present a story which to some extent is congruent with the spirit of the present study. As I argued at the beginning of this chapter, I started collecting data before making choices on the exact nature of the methodological framework for my study. It was only after some data was collected that I started to make out a clear image of how to work with the data and which methodological camp best suited my purposes. This was why I decided to present the chapter likewise, i.e. presenting an account of the data before writing about methodology in general. I will discuss the advantages of the methodology I selected, i.e. grounded theory, in the next chapter. The next reason, as I have already mentioned, was to preserve the grounded nature of the analysis, in the sense that I worked with the data from the very beginning in my attempt to look into the questions I had raised.

As I have shown, hopefully with some degree of success, the data I have been working with in this research has been interrogated more and more in my constant engagement with it: new ideas have emerged, previous ideas have proved to be either important or trivial/not focal to my main arguments, and categories have emerged that have formed the core of my analysis. Most of these core variables have been used in the production of this manuscript, with the more general ones forming chapter titles, and the more particular ones forming smaller sections in the chapters. These will be elaborated on in the next chapter when I discuss the use of QSR.NUDIST in my data analysis. One last point to mention is that I do not wish to claim that the analysis of the data I collected is complete or that it has been done in the best possible way. But I claim that given the time and resources at my disposal, I did my best to rigorously work with the data and make sense of them. I have been constantly referring to the data while writing the chapters of the thesis and there have been many times when I had modified my assumptions and ideas about the analysis. In addition, I have not used all the data and categories I worked with in the present thesis. In other words, there have been raw data and even categories that have proved to be 'junk data' with regard to my focus in the present study, but which I hope I will be able to use in my subsequent studies.

In the next chapter, which is a discussion of my methodological framework at a more general level, I will, as appropriate, refer to the data presented in the present chapter.

CHAPTER FOUR

WORKING WITH GROUNDED THEORY, ETHNOGRAPHY, AND NUDIST: A METHODOLOGICAL FRAMEWORK FOR INVESTIGATING ACADEMIC SOCIALISATION

4.1. Introduction

In the previous chapter I presented a procedural perspective of this study intending that it would reflect the way this thesis unfolded. As I explained there, I started by collecting data, which for me as someone doing research at this scale for the first time, provoked a messy collection of concepts and themes. The real issue for me at that stage was to look for ways that would help me to make sense of the unstructured data. I did this by making use of three tools: grounded theory, ethnography, and NUDIST software. In fact these three tools enabled me to figure out how to organise and analyse the data and look into the interrelationships of the themes and categories so as to arrive at a bigger picture of my study. This chapter, therefore, will act as a bridge between the previous chapter that reflected the unordered picture, and the subsequent chapters that will present coherent arguments on some aspects of academic socialisation of a group of Iranian PhD students in the UK.

This chapter contains three main sections. In the first section, I provide a comparative account of grounded theory and ethnography. I also clarify my own epistemological stance on doing research and will point out what I believe research should do. I will then elaborate on my unit of analysis, and will offer a methodological contribution on the way I resolved the issue of unit of analysis in my study, linking the use of grounded theory and the writing of my thesis chapters together. The next section will

be about the use of the computer software QSR.NUDIST in my study. In the last section of this chapter I will refer to the concept of inter-researcher reliability in my study, explaining a triangulation procedure I performed to assess my interpretations of the data.

4.2. Methodological Framework

4.2.1. Grounded Theory and Ethnography: A Comparison

In this section I present a comparative account of ethnography and grounded theory, in which I will, from time to time, refer to my own research. I will try to make links between these two methodological frameworks and my own study. My point of departure for this analysis will be grounded theory. In other words, in order to make the comparison and contrast easier to follow, I will embark upon grounded theory issues first and I will follow the arguments by pointing out what I see as the counterparts in ethnography.

Grounded theory is the result of the joint enterprise of Anselm Strauss and Barney Glaser. Their book, *The Discovery of Grounded Theory*, published in 1967 was an attempt to propose a systematic method for analysing qualitative data. The basic idea behind this methodological framework is that the researcher starts with data, without any preconceptions, and generates new theories about social structures. The term 'grounded' means that theories that are generated are rooted and stem from the data rather than from preconceived theories. In this sense, grounded theory is not for testing already existing theories but for generating theories:

> I think the strongest case for the use of grounded theory is in investigations of relatively uncharted waters, or to gain a fresh perspective in a familiar situation. In the first instant, it can easily be understood that where no theory regarding a

situation exists, it is impossible to test theory (Stern 1994, p. 116).

According to Agar (1996), ethnography, too, is theory generating (p. 35). In addition, there is a striking similarity between what are considered as data in ethnography and in grounded theory. Stern (1994) states "data [in grounded theory] may be collected from interview, observation or documents, or from a combination of these sources" (p. 119). Wolcott (1994), likewise, has identified three types of data that are usually used in ethnographic research: "participant observation…, interviewing…, and studying materials prepared by others…" (p. 10). Thus, there is a consensus between grounded theory and ethnography in what counts as data.

Following Glaser and Strauss, Stern (1994) outlines the following steps in doing grounded theory:

1. Collection of Empirical Data…from interviews, observation or documents, or from a combination of these sources…

   Coding. The grounded theorist looks for process. As data are received, the investigator applies a system of open coding. This means examining the data line by line and identifying the processes in the data…

   Categorising. … Data are coded, compared with other data and assigned to clusters or categories according to obvious fit. Categories are simply coded data which seem to cluster together…

2. Concept Formation…a tentative conceptual framework is generated using the data as reference. The investigator attempts to discover the main problems in the social scene from the view of the interactants, or actors… Carefully comparing all data as they are received, the investigator makes a choice regarding the relative salence [*sic*] of the problems presented on the scene under study…

3. Concept Development. In this phase, three major steps serve to both expand and densify emerging theory: reduction, selective sampling of the literature, and selective sampling of data…

   Reduction. At this point the investigator has developed an overwhelming number of categories. Category is now compared with category to see how

they cluster or connect…

Selective sampling of the literature. Here, the existing literature, used as data, is woven into the matrix consisting of data, category, and conceptualisation…

Selective sampling. As the main concepts or variables become apparent, they are compared with the data to determine under what conditions they are likely to occur, and if they are indeed central to the emerging theory…

Emergence of the core variables. Through the process of reduction and comparison, the core variables for the investigation emerge…

4. Concept modification and integration. Two major processes dominate this phase: memo writing and theoretical coding…

   Theoretical coding. Codes provide a way of thinking about data in theoretical rather than descriptive terms. This simply means applying a variety of analytical schemes to the data to enhance their abstraction. For the visually inclined, data may be diagrammed, fed into four- or six-fold tables, or drawn into models…

   Memoing. Memoing is a method of preserving emerging hypotheses, analytical schemes, hunches and abstractions…

5. Production of the research report. The research report for a grounded theory investigation presents the substantive theory, substantiated by supporting data from the investigation. As such it differs in several respects from the more familiar report of quantitative studies. Three such differences are the use of the literature as opposed to the utilization of the literature in quantitative studies, the absence of numerical data, and the use of field notes (pp. 119-125).

In other words, in doing grounded theory, the researcher starts collecting qualitative data, codes them on the basis of whatever theme they suggest, finds the most important variables (the core variables), and finally tries to figure out how the categories found are linked to each other.

I will leave my description of grounded theory for a moment and look at ethnography. Agar (1996) writes that the ethnographer starts with 'observation'. When she observes something the meaning of which she does not understand, a 'rich point' occurs. The ethnographer assumes what she has observed should be 'coherent', but given her

present knowledge of the situation under study she cannot comprehend the 'rich point'. In other words, there is a gap between her 'frame' of knowledge and that of the subjects under study, frames being some sort of schemata, showing how variables observed cohere with each other. As the next move, the ethnographer tries to bridge this gap by developing a tentative theory about the coherence of variables observed vis-à-vis the rich point. And finally, she tests this tentative theory in the face of further data.

If we look at the description given in the previous paragraphs on grounded theory and ethnography, we will observe many similarities and some differences. I will point out some of these in the following paragraphs.

The grounded theorist starts with the data rather than with some preconceived theories. As Glaser (1992) puts it:

> The researcher should fight [preconception] and *learn not know,* when telling himself or others what he is studying. Do not say anything until the core problem has emerged and proves to be a stable focus of the research (p. 24).

In contrast with this principle of grounded theory, Agar (1996) believes that the ethnographer should do some literature review before doing the fieldwork. However, he also mentions another viewpoint on the same issue elsewhere:

> But there is a "perverse streak" in some ethnographers that literature will only cloud your mind with other people's mistakes and misconceptions (p. 76).

One similarity between this earlier version of grounded theory and this approach to ethnography is that they both take generating theories rather than testing existing theories as their main objective.

Parallel with the practice of open coding in grounded theory to let categories emerge by themselves rather than be forced into pre-existing categories, ethnographers support a similar procedure, but only in the initial stages of data analysis:

> The trick is to try and develop categories from the way the informants talked, rather than imposing a set from outside. There's nothing necessarily wrong with imposing categories—you may do that later. But that's not what the early phase of ethnography is all about (Agar 1996, p. 153).

Where the grounded theorist looks for 'core variables', which are the focal variables in a social study, the ethnographer will come up with rich points, which are "the data you focus on"(Agar 1996, p. 32). Therefore, 'rich points' in ethnography, and 'core variables' in grounded theory, seem to be similar concepts.

After finding the core variables in the data, the grounded theorist goes through the process of *selective coding*, which means "To cease open coding and to delimit coding to only those variables that relate to the core variable" (Glaser 1978, p.61). As Haddan *et al* (1994) write:

> …at each stage of the research, theoretical concepts are developed in response to the data, but are never left as isolated conceptual ideas. Indeed, no concept is left unlinked; *integration* of concepts is a primary concern in conducting grounded research (p. 161).

Likewise, the ethnographer will try to find out how the categories found in a study integrate with one another. The parallel of integration in ethnography, I think, is 'making a pick':

> A pick is made up of a variety of "found" data from several different social locations… . To make a pick is to place these various pieces of material into a pattern that elucidates their interconnections (Agar 1996, p. 13).

Finally, both grounded theory and ethnography include both inductive and deductive modes of research. In grounded theory the researcher starts with the data and not with some theoretical frameworks and tries to figure out the patterns that govern the situation under study. This comprises the inductive mode in grounded theory. At this point the grounded theorist shifts to the deductive mode and tries to test the tentative theory that has emerged from the data. Therefore, he gathers more data and examines the emerging theory in the face of new data.

In the same way, the ethnographer looks for patterns in the data to find out how the peculiar pieces of data are linked, which is the inductive mode. And in the deductive mode, the ethnographer tests the hypotheses they have formed in the previous stage. The following chart summarises the aforementioned concepts:

	TOOLS	INDUCTIVE/ DEDUCTIVE MODE	AIM	STARTS WITH DATA COLLECTION	IMPORTANT MOMENT	ANALYTIC INDUCTION PROCEDURE
ETHNOGRAPHY	Interview Observation Documents	+	Generating Theories	+/−	Rich Point	Making A pick
GROUNDED THEORY	Interview Observation documents	+	Generating Theories	+	Core Categories	Integration Of Categories

TABLE 4.1: A Comparison of Ethnography and Grounded Theory

Given the extensive similarities between grounded theory and ethnography, it is no surprise that Hammersley (1992, p. 20) has classified grounded theory as an approach to ethnography:

> There are two well known approaches to ethnographic research that move beyond the comparison of unique cases to claim that inferences may be made about the validity of a theory through the study of the case selected on strategic grounds. These approaches are 'grounded theorising' and 'analytic induction'. Both are attempts to apply the hypothetio-deductive method to ethnography. Thus, Strauss (1987: 11-12) describes grounded theorising as involving processes of induction, deduction and verification (p. 20).

The earlier version of grounded theory explained so far has had its shortcomings and has attracted a lot of criticism, and like other trends in knowledge has been exposed to revision and modification. In what follows, I will give an account of a version of grounded theory to which I adhere myself.

4.2.2. Constructivist Grounded Theory

One thing I am concerned with is to clarify my position vis-à-vis methodological and epistemological standpoints. I have found social constructivist epistemology interesting, and this is probably because of the influence of people like Woolgar and Latour (1979) whose main argument, in my view, is that *facts* are actually constructed in laboratories by scientists, but they try to persuade people reading their papers that their *ideas* be accepted as *facts* (p. 40). In addition, along with Griffiths (1998) I do not believe that research in the social sciences can be modelled after research in natural sciences. Rather, I believe that social science research should have its own features. Griffiths (1998) particularly outlines three such features with regard to educational research:

> First, human beings have agency. Unlike the objects of research in the physical sciences — crystals, electrons, atoms, fluids, electromagnetic fields — human beings are not simply passive subjects of research. All human beings react to situations, including the situations of being researchers or research subjects. In other words, they have agency: they can and do construct interpretations of events, and they can and do use such interpretations as reasons to act in particular ways. To put this another way, human beings construct meanings for the events in which they participate. This has a significant impact on what can

> be known about human beings (epistemology) and how anyone could come to know it (methodology) (Griffiths 1998, p. 36).

Then the author refers to 'power' as a second factor influencing educational research. He argues that in most cases power is not equally distributed and this affects research, and he links this to the third factor, 'ethics':

> The issue of power in social interaction alerts us to the third reason why human sciences are significantly different from physical sciences. This is that ethical issues are always relevant where dealing with human beings is concerned. As I have said, research can be on/for/with human beings. The distinction between the three does not apply to the physical objects which are studied in physical sciences. Thus, in the human sciences there are ethical issues which have methodological implications. This is something of no concern in physical sciences (Griffiths 1998, p. 37-39).

Therefore, my approach to research is not based on what is common in sciences. I am also aware that my approach to research is ethnographic in nature, and I am quite interested in many aspects of grounded theory as a "branch of ethnography" (Hammersley 1992). In what follows, I will elaborate on the constructivist version of grounded theory (Charmaz 2000) and align myself with it.

As I mentioned before, the initial version of grounded theory has its own pitfalls. Its emphasis on having no preconceptions, for instance, seems to be quite naïve. This has been addressed by Charmaz (2000) who distinguishes between two versions of grounded theory: an objectivist and a constructivist:

> Like wondrous gifts waiting to be opened, early grounded theory texts imply that categories and concepts inhere within the data, awaiting the researcher`s discovery…Not so (p. 522).

After this refutation of the objectivist version of the grounded theory, Charmaz (2000) argues for a constructivist version of this theory and writes:

> Glaser (1978; 1992) assumes that we can gather our data unfettered by bias or biography. Instead, a constructivist approach recognizes that the categories, concepts, and theoretical levels of an analysis emerge from the researcher's interactions within the field and questions about the data. In short, the narrowing of research questions, the creation of concepts and categories, and the integration of the constructed theoretical framework reflect what and how the researcher thinks and does about shaping and collecting the data (p. 522).

Charmaz (2000) elsewhere elaborates on the same idea and states that a constructivist grounded theory does not claim to be discovering the truth, but only *a* version of reality that is the result of the interaction between the researcher and the data (p. 523).

I believe that the constructivist version of grounded theory is theoretically firm, as it resorts to a systematic methodological framework, and it is also in line with what Schwandt (2000) refers to as one of the interpretivist understandings of knowledge, namely social constructivism. However, one might argue that there is no difference between objectivist and constructivist versions of grounded theory at the practical level, in the sense that one actually goes through the same procedures. The difference lies at the ideological level in that the former believes categories emerge from the data and pretends to be pushing aside the influence of preconceptions, while the latter accepts that categories emerge as the result of the interaction between the researcher and the data. I align myself with the constructivist version of grounded theory (Charmaz 2000) with regard to my own understanding of and approach to research.

It seems necessary at this point to bring in an example of my own research, namely the assignment of topics by engineering supervisors, to further clarify the points explained so far. My approach in this study was congruent with what is conventional in grounded theory. I started with a general research question, i.e. *how PhD students are inculcated into their research communities*. I collected qualitative data through

interviews, observation, and documents, which as I have already explained, are common in ethnography and grounded theory. I encountered a 'rich point' (Agar 1996), i.e. assignment and non-assignment of topics by supervisors, and tried to account for it. This rich point led to other categories, which in turn led to core variables, and then 'saturation' (Glaser and Strauss 1967), i.e. a point where I could say I had found the variables and their interconnectedness and there was nothing else to discover which would make a substantial change in the overall findings.

Another strategy that I used, perhaps with a little bit of feeling guilty, was updating my specific research questions and the schedule for the interviews. However, I was relieved when I found out this was quite legitimate, and in fact essential, within the framework of grounded theory.

Although most variables emerged through the data, I started with reading the literature, which is not welcome in earlier grounded theory. In other words I had preconceptions, frameworks, or some sort of lens, if you like, to look at the data. However, as I have already clarified my methodological stance and aligned myself with the constructivist version of grounded theory, I argue that it is quite legitimate for a researcher to make use of the tools, frameworks and theories to suit their problem. In the next section, after describing my use of NUDIST, I will bring in more examples from my research and will elaborate on the relation among ethnography, grounded theory, and NUDIST.

4.3. My Use of QSR.NUDIST

QSR.NUDIST is a software for 'organising' qualitative data. My use of the word 'organising' rather than 'analysing', which is usually used, is motivated by certain reasons which I will discuss in more detail later, but before that I would like to refer to arguments against the use of computer packages for qualitative inquiry. I do this to justify my use of this software against possible arguments of sceptics who have no or little sympathy with researchers using this or similar software. Charmaz (2000), for instance, is clearly not enthusiastic about using such software:

> I still have some reservations about these programs for four reasons: (a) grounded theory methods are often poorly understood; (b) these methods have long been used to *legitimate*, rather than to conduct studies; (c) these software packages appear more suited for objectivist grounded theory than constructivist approaches; and (d) the programs may unintentionally foster an illusion that interpretive work can be reduced to a set of procedures (p. 520).

The reasons mentioned by Charmaz (2000) in the above quote, and more specifically the last one, imply that such software packages actually 'reduce interpretive work to a set of procedures'. She further refers to Yvonna Lincoln as saying to her students, "why would you want to engage in work that connects you to the deepest part of human existence and then turn it over to a machine to 'mediate'?" (Charmaz 2000, p. 521). What I would like to argue is that such software packages do not and cannot 'mediate', nor do they 'reduce qualitative enquiry to a set of procedures'; quite the reverse, they make interpretive work more efficient by making data more organised and easier to work with. I will explain this in the following paragraphs.

The first step in my argument for using this soft ware is to explain NUDIST, and try to show why sceptics are against using such software in qualitative research. My account of NUDIST is by no means conclusive and is only intended to clarify the

points I am making in this and the following chapters. I will then mention Wolcott (1994) on three ways of handling qualitative data. This is important to clarify why I use the word 'organising' rather than 'analysing' to describe the application of this software.

NUDIST has two main sections: a node explorer and a document explorer (Gahan, *et al.* 1998). A 'node' is more or less equivalent to the more common word 'code'. The node explorer itself includes two types of nodes: free nodes and index tree roots. 'Free nodes' is equivalent to the concept of 'open coding', where the relations between codes/nodes are not made clear, and the 'index tree root' is equivalent to 'concept modification and integration' in grounded theory where the researcher attempts to interpret the data and form how 'bits and pieces' of data are related to each other. The other section of NUDIST, i.e. the document explorer, is where the data are kept. These could include interview transcripts or observations and field notes that have been saved as *.txt files and imported to the programme. The researcher can start with 'browsing' the data and coding them as free nodes (open coding). As data accumulates in the programme little by little, given the organisation of the coded data, the researcher can do the reflection and interpretation better and change the 'free nodes' to 'index tree roots'. It is always possible to change the coding and the way the codes are related in subsequent analyses. In each step of the analysis the researcher can 'make reports' and print out the results of the coding and pieces of text which have been coded. The package also gives the user the possibility to have a visual format of the tree diagrams. Some printouts of the present study are provided in Appendix V. In short, NUDIST is a computer package that helps the researcher organise their data more efficiently and by doing so, make better interpretations of the

data. I hope this very brief glimpse of NUDIST is sufficient to enable the reader to follow on my argument for justifying the use of this software in this study.

I explained earlier in this chapter that Wolcott (1994) refers to the three ways in which qualitative data can be collected: "participant observation…, interviewing…, and studying materials prepared by others…" (p. 10). He further explains three ways through which the qualitative researcher makes sense of the data: description, analysis and interpretation:

> *Description* addresses the question, 'what is going on here?' Data consists of observations made by the researcher and/or reported to the researcher by others.
>
> *Analysis* addresses the identification of essential features and the systematic description of interrelationships among them—in short, how things work. In terms of stated objectives, analysis also may be employed evaluatively to address questions of why a system is not working or how it might be made to work 'better'.
>
> *Interpretation* addresses procedural questions of meanings and contexts: 'How does it all mean?' 'What is to be made of it all?' (p. 12).

It seems to me that Wolcott, by this categorisation of how to handle qualitative data, has identified three levels at which such data may be addressed. An instance of the description of data can be my account of the interviews I did with the students under study in the previous chapter. In retrospect, I can say that I was telling stories of each of the interviewees based on a process of open coding I had carried out. The next level, analysis, is the result of the reflexive engagement of the researcher with the data. At this level, the researcher reflectively explores the interrelationship among the themes and the codes he has identified in the data. This is why I said NUDIST is for 'organising' data. Using NUDIST can ensure that data are organised in a way that makes the reflexive engagement of the researcher with the data more efficient. In fact,

I argue that the use of the word 'analysing', which requires reflexive activity on the part of the researcher, is one of the reasons for arguing against such software. Wolcott (1994), too, reserves the word 'analysis' for the reflexive engagement of the researcher with the data, and uses data "processing" (p. 24) to refer to the mechanical input of the data into computer programmes. The last level of engagement with qualitative data, according to Wolcott (1994), is interpretation. This is the deepest level of engagement in which the researcher makes sense of the whole picture and presents his understanding of the context under study.

One important issue to consider would be to see what NUDIST does and what it does not do. This is important because, I believe, that one of the main arguments against this software is lack of understanding of this issue, though my description of this software is by no means comprehensive. I will start by specifying what NUDIST does not do for the researcher. It clearly does not 'analyse' or 'interpret' the data in the sense Wolcott uses these terms. It does not identify the themes to be coded in the analysis, and in fact like any other well known software it cannot think and make judgements. What NUDIST does for the qualitative researcher is comparable with what descriptive statistics does for the quantitative researcher. It organises data in a way that makes it easier for the qualitative researcher to look at them. It helps the researcher to invest their efforts in the analysis and interpretation of the data by releasing them from the burden of having a set of different themes and ideas in their working memory. This software organises data in a way that the researcher can search for specific pieces of qualitative data they have coded. In my analysis of the data, for instance, I had found certain cases in which the engineering supervisors assigned topics to their students. Based on this initial reflexive process, which was the result of

my engagement with the data, I coded instances of this theme in the transcribed interviews. I had then put these codes into NUDIST as 'free nodes'. In later engagements with the data and upon more reflection, I could better understand how this 'free node' was related to other 'free nodes' in my data. This further led me to make an 'index tree root' of the codes. For instance, I could now see that topic assignment was closely related to the nature of research in engineering. It was also related to funded research. At the same time, topic assignment often created different reactions on the part of engineering students and led to a set of different relationships between supervisors and students. Using NUDIST enabled me to make sense of the free nodes (open codes) and come up with clusters of nodes that were related to each other (see Appendix I & II).

4.4. Methodological Contribution

One of the important issues in any qualitative research is defining the unit of analysis of the study. One definition of unit of analysis would be the notions upon which the researcher focuses, or the variables that are looked at in the study. From another point of view, a unit of analysis is much more than the variables under study; it is the relationships that exist among variables (Street, personal communication). This emphasis on interrelationships is very important in post-modern thought as is evident in the following quote:

> In an introduction to phenomenological philosophy, Lyotard (1991) points out that the intentional relation of subject and situation does not unify two isolated poles; on the contrary, the subject and the situation cannot be defined except in and by this relationship (Kvale 1996, p. 44).

The issue that I would like to tackle in this section is the unit of analysis in my study.

Taking into account the concept of interrelationships among the variables in research,

I would argue that my study was concerned with the broad issue of the academic socialisation of the PhD students in my study. This broad unit of analysis, however, consists of some interrelating variables, the two most important of which were the supervisors and the students. However, it is difficult to say that my focus is only on the students or on the supervisors. This is because these two are meaningful only in relation to one another.

In addition, I do not think that there should be only one unit of analysis in a study. My study consisted of a set of units of analysis: one major unit of analysis that I refer to as the main unit of analysis, and some sub-units of analysis that were in fact different ways of looking at the main unit of analysis. The main unit of analysis in my study was the way students in the social sciences/humanities and engineering are socialised into their academic fields or discourse communities. It is interesting to note that this main unit of analysis of my research corresponds to my main research question, and also to the title of my thesis.

This bigger unit of analysis was further divided into sub-units of analysis that looked at the bigger question from different perspectives. These sub-units of analysis were the core variables that emerged as the result of the interaction between my data and me as a researcher (Charmaz 2000). For instance, the main core variable that emerged was 'communities of practice'. I will try to see how far my data is consistent with ideas suggested in this theory, and will specifically focus on similarities and differences between ideas suggested in my data and those found in the theory in the following chapters.

As another example, 'student-supervisor relationship', which is a factor in academic socialisation, was another of the core variables found in my data. This formed a second sub-unit of analysis in my thesis. Likewise, each sub-unit of analysis in my study roughly corresponds to one of the chapters in my thesis. The following memo which I recorded in my research diary is illuminating in this respect:

> Memo 13/04/2001
> It occurred to me today to raise the issue of unit of analysis [and writing] with regard to the list of chapters I am going to propose in my next report. It may be that for each chapter I should choose a different unit of analysis. One chapter, for instance, might be about the relationship between students and supervisors, in which the unit of analysis would be supervisor-student relationships. Another might be the role of assignment in discourse communities, in which the unit of analysis would be assignment. For a chapter on communities of practice, I might choose student-student relationship as my unit of analysis.

I would conclude this section by linking grounded theory, unit of analysis and writing a thesis. I believe that a researcher who uses grounded theory can regard their main categorical unit as the main unit of analysis, and the other core variables as sub-units of analysis. The main unit of analysis would correspond to the main objective of the research and would form the title of the thesis. The sub-units of analysis, which are in fact different aspects of the main unit of analysis, lead to the data-based chapters in the thesis.

4.5. Inter-Researcher Reliability

In this section I will describe a triangulation procedure I used in my study to ascertain the degree to which my interpretations of my data are reliable. I will present different codings done by me and five other research students at this point. Before that, however, it is essential to address an important question: *is it necessary to seek reliability in one's interpretivist account or not?* I would argue that at least from a

pragmatic point of view it would be quite helpful to do so. I will address this issue in more detail at the end of this section. In what follows I do not intend to give a comprehensive account of different codings, but only point out some similarities and differences between these.

I made a presentation to the Students' Support Group on the 30 January 2001. The support group included research students who were mainly doing qualitative research and they usually got together every two weeks to discuss their problems or to present their research. In my presentation, I asked the other five students who were taking part in that session to have a look at the first four pages of my interview with one of the engineering supervisors, Dr.e3, and code it for me. Then I asked one of them to tell the others the way she interpreted the data. This created an interesting discussion in that some of the themes and codes they had found in the data seemed to be very similar while others were not. I will give an account of the range of interpretations brought up in that discussion below, but I would like to say that at the end of the session we concluded that it is quite natural for different researchers to come up with different interpretations. What is important is to present the interpretation in a coherent and consistent argument. I would like to add that in line with the social constructivist view of knowledge, our contributions to knowledge—or in other words our interpretations of our data—are inevitably constructed as a result of our consciousness of what is acceptable in our discourse community. Therefore, so long as our data collection and analyses are on the basis of the norms and expectations of our discourse community and we present our arguments convincingly, I presume our contributions are legitimate and acceptable.

As I mentioned at the beginning of the previous paragraph, I had five PhD students code the beginning of the interview I had with Dr.e3. One of these students was quite familiar with Lave and Wenger (1991) and her ideas about the data were in some respects similar to mine. I will compare and contrast some aspects of this coding that I think are interesting. The full chart showing these codings is in Appendix III, and the full interview is in Appendix IV.

I had coded the ideas presented by Dr.e3 in paragraph H1 and H2 as representing his epistemological assumptions. This attracted the attention of only one of the other colleagues who had noticed that section of the text as reflecting a "positivistic conception of science".

The next paragraph—H3—was the one which had received the most attention. In fact, one of the colleagues who was familiar with Lave and Wenger' ideas had coded only this paragraph, but in detail. She had observed that Dr.e3 seemed to be using the word "teaching" and "learning" in quite specific ways. She proposed that Dr.e3 was using "teaching as telling", while he gave more prominence to "learning as practice". Another of the colleagues had coded it in a similar manner and had coded this part of the interview as "active against passive learning". Two others had not gone further than seeing it as a "contrast between teaching and learning".

I had coded the task of teaching undergraduate students as one of the strategies supervisors use to further students' understanding of discourse communities. This was coded as "students as teachers" by one of the colleagues. Another colleague had suggested that the "process of learning [seemed to be] useful to teacher as learner but

not to [undergraduate] students". However, I would like to suggest that there is possibly a bilateral learning process at work when PhD students teach undergraduate students, in that both parties benefit from and learn in this experience.

One of the points I had not noticed at all, but was raised by one of the colleagues in the support group, was the implication made by Dr.e3 in paragraph H5 that he could speak from the point of view of students. This is comparable with Dr.e2's speaking from the point of view of students, who had mentioned several reasons for doing a PhD, one being that some students do not know what they want to do in their lives and find student life agreeable.

In paragraph H6, the institutional policies regarding doing a PhD had attracted a lot of attention. It had been coded in very similar terms such as "financial/ funding policy" and "external financial elements".

The assignment of topics by supervisors (paragraphs H6 and H7) based on their need to have manpower to find answers to their questions was also considered by colleagues in the support group. One had seen it as "needs of supervisors", and another had commented "who owns the problem?" Looked at from a different perspective, one had seen the context in which students do not have any topics at the beginning of their studies as "needs of students", while the same thing was seen as "expectations of supervisors".

One interesting point was that Susan (pseudonym) seemed to be an 'outlier'—to use a statistical term—among the six different people (including myself) who coded part

of the interview with Dr.e3 (Skehan, personal communication). If we refer to the table presented in Appendix III, we will notice that she had used codes that by no means corresponded to the codes used by others. Second, it seemed that the others were approaching the task from more or less similar points, although at different levels of delicacy. For instance, where I had used the general term "epistemologies", John had used "positivistic conception of science", which seems to be a more precise conceptualisation of the idea.

I had coded the practice whereby supervisors have their PhD students teach undergraduates as "supervisor strategies", and I had further included "supervisor strategies" under "dissemination of knowledge", which was itself part of "epistemologies". All others, with the exception of Susan and Carol, had conceptualised it in a like manner, and John's code—learning by teaching—seemed to be particularly similar to mine.

In addition to the point mentioned above, John's idea on the assignment of topics by supervisors was very similar to that I had in mind. Where I had coded this phenomenon as "assignment: supervisors' unanswered questions", John had coded it as "career benefits for the supervisor".

Jane, too, was quite similar to me in approaching the interview, although, as I had written before, she had coded only the second paragraph. She had used codes such as "understanding by listening to newcomers", "Teaching by telling and learning by practice", which were vividly linked to Lave and Wenger (1991). This was no surprise, as I knew she was working on situated cognition.

I should also say that the codes used by all other people in this study were open codes with no attempt to categorise them in hierarchies. This is quite understandable as they had only around 10-15 minutes to code the text.

In conclusion, this procedure of having other students code part of my data helped me to look at the issue from different perspectives. Not denying the fact that others mentioned some issues that had completely escaped my attention, I should say that I could trace my line of reasoning and interpretation in the others' codes.

In sum, among the 52 instances of texts coded by me and at least one other member of the support group, I could identify 10 instances in which the themes coded were very similar to one another. These are marked by an asterisk at the bottom of the text units in the analytical table in Appendix III.

At the end of this discussion, I would like to reiterate that the concept of inter-researcher reliability can be useful if it is looked at as a forum in which one tests one's intuitions concerning data interpretation (Street, personal communication). The procedure I used in the Discussion Group was mostly characteristic of an open coding phase. Another procedure would be to come up with a set of more or less well defined categories and ask some colleagues to code part of the data on the basis of these categories and examine the extent to which there is agreement among different researchers concerning that piece of data (This was brought to my attention by Jeremy Hodgen in an email he sent me a few days after the Support Group meeting). I am also aware that those at the far end of the interpretivist-positivist continuum may reject the whole idea of inter-researcher reliability and argue this is totally

unacceptable as any research is the result of the interaction between the researcher and the data. They might argue that if the researcher is changed, the whole interpretivist phenomenon is changed, and in fact this positivistic concept is neither necessary nor legitimate in an interpretivistic study. Nevertheless, I believe that if there is anything to be gained in this procedure, it is worth considering.

4.6. Conclusion

This chapter was an attempt to present my methodological framework in this research study. I framed my methodology as a constructivist version of grounded theory (Charmaz 2000). This framework is consistent with an interpretivist approach to research (Schwandt 2000) and at the same time is rigorous in conducting research. This rigor is the result of its systematicity with regard to data collection and data analysis. As I have argued in this chapter, it is also useful to consider core variables as sub-units of analysis to produce better research reports.

This study is within the framework of a case study. This case approach, I would argue, enables researchers to look at data while paying more attention to details. What is important in this case study approach, as I have already argued, is not a 'representative case' but a 'telling case' in which different pieces of data are linked together to present a coherent picture of the situation under study (Mitchell 1993, p. 239). In fact, my selection of the participants was based on the concept of a 'telling case' (Mitchell 1993) and my handling of the data was based on the constructivist grounded theory:

> What the anthropologist using a case study to support an argument does is to show how general principles deriving from some theoretical orientation manifest themselves in some given set of particular circumstances. A good case study,

> therefore, enables the analyst to establish theoretically valid connections between events and phenomena which previously were ineluctable. From this point of view, the search for a 'typical' case for analytical exposition is likely to be less fruitful than the search for a 'telling' case in which the particular circumstances surrounding a case, serve to make previously obscure theoretical relationships suddenly apparent ... Case studies used in this way are clearly more than 'apt illustrations'. Instead, they are means whereby general theory may be developed (Mitchell 1993, p.239).

In the following chapters, I will present analytic accounts of the descriptive data in *Chapter 3* informed by my discussion in the present chapter, and attempt to make 'telling cases' out of the data I have collected. In each of these chapters I will focus on one sub-unit of analysis in my study, which I have outlined in *Chapter One*. In each of these chapters, I will look at the issue of academic socialisation of the PhD students under my study from a different but related perspective.

And last but not least, I understand the limitations of case studies in making generalisations. Therefore, what I will present in the following chapters will be about the participants in my study, and I do not intend to generalise the findings to the whole population of PhD students and supervisors.

CHAPTER FIVE

RESEARCH STUDENTS AS COMMUNITIES OF PRACTICE

5.1. Introduction

As discussed earlier, the main focus of this research is the academic socialisation of PhD students in their fields of study. I have tried to look at academic socialisation from different perspectives, one being that PhD students can be regarded as newcomers to a discourse community who acquire the norms and expectations of their respective research communities and become legitimate members of these communities themselves. This will be further developed in *Chapter 6: Research Students and their Supervisors*, and *Chapter 7: Topic Assignment in Discourse Communities*. In this chapter, namely Research Students as Communities of Practice, I am going to look at the issue from a closely related perspective, and investigate the extent to which PhD students in the two fields under study, i.e., engineering and the social science/humanities, and their supervisors, can be regarded as communities of practice.

In this chapter, I will draw upon the themes I have encountered in my interviews with 8 engineering and 5 social science/humanities students, as well as 4 engineering and 2 social science/humanities supervisors, and elaborate on the extent to which these can be mapped onto the three dimensions of a community of practice—mutual engagement, joint enterprise, and shared repertoire—as discussed by Lave and Wenger (1991) and Wenger (1998). In other words, my point of departure will be the themes that emerged during the process of data collection and analysis. As there are

certain similarities between these themes and the theory of communities of practice, I will engage in a comparative study. This follows naturally from the context of the constructivist grounded methodology I have been using in this research study. As I have already mentioned in *Chapter 3* and *4*, the use of QSR.NUDIST in my study has contributed to the overall analysis of the data. Next I will compare and contrast two documents concerning research training in the two fields of the social science/humanities and engineering, namely the *ESRC (Economic and Social Research Council) Postgraduate Training Guidelines* (2001) and a PhD training set of Guidelines from an engineering department in the UK. I will engage in this document analysis in order to investigate the extent to which these documents are consistent with the actual practices going on in the engineering and the social science/humanities sites I have visited. In addition, I will show how certain ideas are taken for granted in these documents as 'prescriptions' to be carried out by higher education institutions with no reference to empirical evidence. This is important in that these guidelines are meant to be translated in actual practice and should have a sound evidential basis.

At the end of this chapter I will summarise the main arguments of this chapter and will look at the areas in which my data overlap with *communities of practice*, and areas that seem to be different. As a result, I will suggest some modifications of Wenger's (1998) model of 'dimensions of practice' in *Chapter 8*.

5.2. From Dependence to Independence

One of the focal points I noticed in the interviews with both the social science/humanities and engineering supervisors was that they were more or less adhering to a theory according to which the new PhD students are novices who should

learn the trade of doing research in their discourse communities in a step by step process. This is very similar to the idea of legitimate peripheral participation (Lave and Wenger 1991; Wenger 1998). According to this concept, "learners inevitably participate in communities of practitioners, and that the mastery of knowledge and skills requires newcomers to move towards full participation in the sociocultural practices of the community" (Lave and Wenger 1991, p. 29). As I discussed in detail in *Chapter 2*, this is very similar to the concept of *the zone of proximal development* set out by Vygotsky (1978, p. 86), and its more concrete translation, *scaffolding* (Wood, *et al.* 1976; Wood & Wood 1996). This concept, although originally meant to explain the process of development in children, is very illuminating in the context of this study of older students. According to the concept of the zone of proximal development (ZPD), less capable peers are helped by more capable ones until they develop independence in their social practices (Vygotsky 1978, p. 86). The following extracts from my interview data point out this ZPD feature of communities of practice to a certain extent. It is interesting to note that this concept was present in both the social science/humanities and engineering settings under this study.

Dr.h1, a social science/humanities supervisor, believed that there should be more help and support from the supervisor in the initial phases of doing a PhD. She believed that as students would not be able to spend all their lives on doing a PhD, there should be a greater sense of direction in the first few months. She even believed that doing a little bit of writing for students would be justifiable on the same grounds:

> … just a little bit … maybe starting off a paragraph … I start a sentence, or I start a paragraph. I can see something , which I see as missing, which is not clear. And allow the student to take from there. It's a bit of kind of scaffolding, if you like. And that kind of thing will become less as the student becomes more familiar with the writing … (Dr.h1, social science/humanities)

Dr.e1, one of the engineering supervisors, too, had a more or less similar idea. He believed that PhD students should be led into the practice of doing independent research step by step. In fact he believed that this gradual process was often a more important cause of success than studiousness:

> If you [the supervisor] don't go through this gradual step by step procedure, they [the students] may get lost altogether, they don't know how to start, how to do it … and just … they just get lost despite the fact that they have been very studious. (Dr.e1, engineering)

This scaffolding procedure was just what Dr.e1 was adhering to in the gradual process of setting free his students in the assigned tasks in the initial stages of doing a PhD. As I will mention in *Chapter 6,* one of the strategies the engineering supervisors followed was to assign easy tasks to their PhD students in the initial stages, and gradually set them their real PhD topic:

> … and gradually I expect them to be creative and to come up with their own ideas. Not just stick to my own [*sic*] ideas, but also on top of that to initiate new ideas (Dr.e1, engineering).

Dr.e1 further elaborated on this issue by pointing out that students in their third year would not normally run to him for all their problems, whereas first year students usually do so. This again indicates a scaffolding structure going on in engineering departments. In the initial stages of the PhD newcomers receive more support from their supervisors, but the more capable peers gradually take on the role of the supervisor. I would argue that this dynamic process, which is a complex one, is an instance of 'social complexity', an element of 'mutual engagement' in communities of practice (Wenger 1998, p. 73).

Dr.e2, another engineering supervisor, had a *romantic* view of a gradual move from dependence to independence, and "progressively releasing the student from the harness of task assignment and more and more initiative and independence" (Dr.e2). However, he modified this linear image of progressing from dependence to independence by building into it a dynamic component, which is dependent on the *readiness* of students:

> And if the student is responsive, I will give them more liberty. If the student has not been responsive, doesn't seem to be ready to get the liberty, it's back to more task wised assignment. So it's a progressive that goes actually back and forth, we all are humans, we all have good periods, bad periods, and I don't see there is a linear process (Dr.e2).

The idea of gradual development of independence was also observed in the interviews with the engineering and the social science/humanities students. Koorosh, an engineering student, had noticed that he met his supervisor much more when he had just started his studies. After one and a half years, he met his supervisor less often, and in addition the quality of the meetings had changed. What is interesting is the degree of transparency of this issue between Koorosh and his supervisor:

> Then he told me that I should reach a level when he could give me more independence little by little, so that I could supervise other students myself. So now after one and a half years we still have meetings, but it's no longer that he tells me what to do, rather I report to him what I have done (Koorosh, engineering student).

The initial help that the social science/humanities students under study had received was usually in the form of greater support to narrow down the topic of research selected by the students themselves. This could be regarded as 'scaffolding' the formulation of a researchable topic:

> [My topic] was something general before, i.e., I wanted to compare Balochi with Sogdian, and I wanted to compare all aspects. … . But when I came here, and after several discussion, my supervisor told me to focus on only one aspect of these languages, and following this [suggestion] I changed my topic to the comparison between the verbs in Balochi and all other Iranian middle languages (Hamid, social sciences/humanities).

Therefore, the idea of gradually moving from dependence on the supervisor to independence was very much grounded in the practices of these supervisors, whether in engineering or in the social science/humanities. I should like to emphasise once more that this could be seen in terms of the concepts of the 'zone of proximal development', 'scaffolding', 'apprenticeship', and 'legitimate peripheral participation' discussed in *Chapter 2.*

5.3. Student-Student Relationships

A significant feature of communities of practice (Wenger 1998) is relationships. These are also among the important themes I encountered in my interviews with the supervisors and students in the two fields of engineering and the social science/humanities. When talking of relationships, one might think of participants in relationships as an important aspect that can form the nuclei in such relationships. In the contexts I have studied, there were three important groups of participants: the students, their supervisors, and all other sorts of participants including other members of staff and technicians, but before attending to these in more detail, it seems appropriate to briefly mention the procedure I followed in my use of NUDIST to reach these three main categories.

In the initial open coding procedure of putting the data into NUDIST, I had categorised instances in which the students under study interacted for learning

purposes, which I had coded as 'working together' (see 3.3.1.5. Case 5). I had also encountered instances in which a student had received a lot of support from members of staff other than their own supervisor to conduct their research, and I had coded this as 'doing things together' (see 3.3.1.2. Case 2). I had also come across different types of potential relationships between the students and their supervisors, which I had put in NUDIST under various codings, such as 'student-supervisor relationships', 'topic assignment', 'pushing students', etc. In the later stages of data analysis, and upon further reflection, I could categorise these open thematic codes at a more elaborate level and identify the 'umbrella codes' for each group of codes.

I categorised two different types of relationships in this context: *student-student relationships,* and *student-supervisor relationships.* As the latter is very important in the future success of PhD students, I have devoted an entire chapter to it (*Chapter 6*). In the current chapter, I would like to elaborate on student-student relationships. I will specifically describe this type of relationship in terms of *Doing Things Together, Learning by Doing and Learning from others, Lonely Researchers,* and *Competition.* These were some of the themes that have emerged in my grounded theory approach to the present research. The first two are covered in the theory of *communities of practice* (Wenger 1998), but the others are not given much attention in this theory. I will represent my own elaboration in the light of the data I have gathered below.

5.3.1. Doing Things Together

One of the important differences that I observed in the two fields of engineering and the social science/humanities under study was variety in both the quantity and quality of mutual engagement across these disciplines. Most engineering students seemed to

be working on related projects requiring some degree of collaboration between them and the other members of their departments, while the social science/humanities students seemed to be working more or less in isolation. Other similar observations were reported in detail in *Chapter 2* (e.g. Shaw 1991).

Dr.e2, for instance, believed that PhD students would inevitably have to work in collaboration with others out of necessity. In other words, the nature of the projects in engineering is such that the people working in a department would have to have collaboration with one another:

> I said the department community … of course it is utilitarian, I'd say, because a student will need the help of most of the people working in the department in which he studies. And conversely, the students can provide work for the staff, because they do their jobs at one time or another (Dr.e2, engineering).

Two of the first year engineering students, Farokh and Shahram, too, although working in isolation at the time of the interview, believed that the nature of their projects were such that they would inevitably have to work in collaboration with others sooner or later. After almost a year, in June 2001, in a follow-up interview with Farokh, I found that this had actually happened and people engaged with different aspects of the 'bigger' project Farokh was involved in had held a seminar on the progress of their share of the project.

One of the best examples I can cite for *doing things together* was the case of Saeed, an engineering student. As I discussed in *Chapter 3*, he had to make an instrument for his PhD project to do some measurements. This measuring instrument worked with a laser. As he was not an expert in the laser technology, and in fact he had only rudimentary knowledge of it, he had to work in close collaboration with the head of

their section, some other supervisors, some students working on lasers, as well as some of the technicians at his school. In other words, he had made use of *what others knew* in order to conduct his research. As I pointed out in *Chapter 2*, in a community of practice one does not need to know everything, but to know who is good at what (Wenger 1998, p. 78). This was very much the case for Saeed. He did not know much about lasers, but he had managed to learn about the *network of practice* in his section. In other words, he had acquired the knowledge of *who-to-go-to* when in need of help. We will see this same type of 'expertise' with Bizhan, another engineering student, later in this chapter.

Koorosh, another engineering student, had in some instances referred to other students for help, and he often helped other students himself, although he saw some difficulties in his collaborative efforts that I will take up later. However, I would like to consider here that his supervisor often referred him and other students to each other. This was because the topics they were working on were similar enough to require cooperation, although, as he put it, they had differences too:

> It's quite usual that my supervisor send me to other students or other students to me to share our work and our programs. So when I have a problem in my work, I may use another student's findings, and I usually don't do everything myself. In fact we all work together, but each of us works on a specific branch of the subject (Koorosh, engineering).

Bizhan, yet another engineering student, was working in a large room together with four or five other engineering students and an RA (research assistant). He, too, had the experience of helping and being helped. He had many times referred to the RA (Research Assistant) for programming, and he had also helped other students referred to him through his supervisor. I will elaborate on the role of the supervisors in

students working together below, but what I would like to emphasise here is the similarity of Bizhan's experience and that of most other engineering students concerning helping other students and being helped by other students. In addition to the 'mutual engagement' (Wenger 1998) Bizhan had with other students in his section, he also worked in close collaboration with his supervisor on writing papers. In fact, they had published several papers together, the first with his supervisor's name as the main author, and the names of two other students, including Bizhan, as additional authors, and the other papers with Bizhan's name as the main researcher.

The role of the supervisor in having students work together is the next issue I would like to embark upon within the context of *working together*. As I mentioned in a previous paragraph, the engineering PhD students under this study often worked together, but this had its own problems and limitations. There were occasions when the PhD students preferred not to work together for various reasons. Koorosh, for instance, believed that the main criterion for students working together is the *personalities and nationalities* of PhD students. In fact, he had tried to work out a mutual cooperative relationship with a student from Korea, but he had not managed to sustain that because, as he put it, the Korean student was not *sociable*. This theme was reiterated in a narrative told to me by Dr.e4, an engineering supervisor. She remembered that she had had two Brazilian students who were very collaborative, but this collaboration was the result of their being from the same country rather than working on similar projects:

> I had two Brazilian students, who sort of kept each other's company, and we were working in the same area, but they knew each other …they lived in the same hostel. Their companionship came from living with lots of other Brazilian students rather than, in fact, working on the same project (Dr.e4).

This observation was not particular to this site under study. As I explained in Chapter 3, Koorosh and Ali, two engineering students, had observed that 'personalities and nationalities' were often important factors in working relationships among the research students in their departments. I had coded this in NUDIST as 'problems in working together'.

This is very illuminating in the context of the theory of communities of practice. I will give a general evaluation of the extent to which the social science/humanities and engineering students I studied resembled a community of practice later, but I would like to argue here that these humanistic and affective aspects seem to be lacking in the theory as put forth by Lave and Wenger (1991) and Wenger (1998). It seems to me that these theories pay too much attention to 'communities' as 'units' at the expense of paying little attention to 'individuals' as 'smaller units' that comprise the overarching unit of a community. I do not intend to argue that the qualities of a community are equal to the sum of the qualities of its members, but I do not see communities as being pure 'gestalts' either (Miller 1962; in Richards *et al.* 1992). Rather I believe that individuals may and in fact do make differences in the communities they belong to. I will take this up again when I refer to 'competition' as a factor that might negatively affect a community of practice.

Likewise, Ali, another engineering student, had tried to establish a working relationship with a PhD student from England, but with no success. Ali saw the reasons behind this lack of success in maintaining a working relationship with this English student as twofold; first she was a *woman,* and second, she was a *senior* student and probably thought she would not get much out of such a working

relationship. That was why they were only referred to each other through their supervisor.

Ali, however, had a very good working relationship with a second student. They often helped each other with the references they had. They also compared the results of their experiments. The relationship Ali had with this second student was not a function of their supervisor referring them to each other, but they referred to each other freely whenever they thought it was necessary. This brings into the picture another aspect of 'social complexity' as an element of 'mutual engagement' (Wenger 1998). It can be said that certain people seem to get along better with each other. This, simple as it may seem to be, is in fact complex. In fact it requires research on a large scale bringing together psychological and sociological factors, as well as micro-analytic studies of conversations in communities of practice to bring to light factors that lead to this situation. This, however, is beyond the scope of the current research.

Farokh, another engineering student, however, did not have that much contact with other students. In fact he had had no idea that his project was part of a larger project for the first few months of his study. After he had finally found out that he was taking part in a larger project, his supervisor had asked him to go and see a Korean who had finished his PhD but was still working on this larger project:

> There's a Korean guy who has his PhD, and he's been working for a year now for the university. And it happens that he wants to go back home. So my supervisor told me to go and see him and see what he's done (Farokh, engineering student).

The ideas mentioned in this section point to the fact that many of the instances I observed in my interviews with these students and their supervisors are analogous

with *Doing Things Together* as one of the dimensions of communities of practice (Wenger 1998). However, I should reiterate that the affective side of these working relationships are not given the voice they deserve in this theory. For instance, feelings and emotions are ever present in any sort of relationship and cooperation among the students and supervisors mentioned, as the quotes above demonstrate, but these are not given enough weight in this theory. As I explained in this section, and as it was raised by one of the student interviewees, *personalities and nationalities* seem to be important factors in any sort of mutual engagement.

5.3.2. Learning by Doing and Learning from Others

In a community of practice learning does not only take place through a formally planned curriculum. Rather the borderline between learning and the practice newcomers engage in is somehow blurred (Wenger 1998), or as Wenger asserts, it is "the stage and the object, the road and the destination" (p. 95).

In other words, we should in fact talk of 'informal learning' rather than 'formal learning', not from a psychological point of view (see Krashen 1985 on acquisition/learning), but from the social/embedded point of view I argued for in *Chapter 2*. In that chapter I defined 'informal learning' as a type of learning that is embedded or situated in the context in which it is meaningful, and I also argued that this will make it unnecessary to talk about acquisition/learning referred to by Krashen (1985) and later by Gee (1996; 1999). I should also add that I believe that both 'formal' and 'informal' learning are present and useful for people involved in a higher education setting, although, I should add, 'informal learning' seems to be more powerful than 'formal learning'. In this sense all the social practices that PhD students

engage in while conducting their projects are learned informally because these are embedded in social practices and contextualised, while research training workshops seem to be associated with formal learning. I will refer to these later in this chapter when examining the *ESRC Postgraduate Research Guidelines* and a set of engineering PhD guidelines, and I will investigate the extent to which these two are addressed in these documents. I should also add that a distinction seems to be necessary between 'informal' and 'formal' learning as *processes* of learning, and *what* is actually learned as *products.* This, however, is outside the scope of the present research though it would seem interesting to explore whether there is any association between the *processes* of *formal* or *informal* learning and the *products* of *implicit* and *explicit* learning.

In this section, I will try to look at the concept and practice of informal learning as interpreted in my interview data, and explore this aspect of communities of practice. One of the important themes in my ethnographic data was the significance of informal paths of learning. Dr.e2, one of the engineering supervisors very explicitly stated that PhD students only learn everyday practices by engaging in them rather than by attending seminars:

> I think the real way to learn things is by doing them … not by attending seminars, teachings, etc (Dr.e2, engineering).

The engineering students I interviewed were often asked to do certain simulations of previously performed experiments to learn the basics of their job and to be initiated into the practices of their profession. Bizhan, for instance, upon starting his studies had found his supervisor and another PhD student working on a project. His supervisor had asked him to do a small part of that project. After the project had been

completed, the three of them had written a paper on it. In other words, they had gone through all the processes of this project, from actually performing the experiments to the writing of a publishable report and article revisions required by journal editors together. Bizhan had not gone through a formal phase to formally learn these things, but he had actually engaged in these activities to learn them.

Bizhan also had this experience of solving his programming problems with one of the people working in his section. He was aware that he himself was not much of an expert in programming, but he was familiar with people in his section and knew the area of expertise of each of them:

> [when] I need programming for my work, … I go to this Mr *** (he points at someone who is present in the room). Or there have been times when some students need my information or my work, and I have helped them (Bizhan, engineering).

As I mentioned before, one of the features of a community of practice is that one does not need to know everything, but one does need to know who is good at what (Wenger 1998, p. 78). This is what Bizhan had found to be important, and as he put it, "it's easy to see who's good at something".

The idea of 'knowing who is good at what' is mentioned in *Communities of Practice* (Wenger 1998, p. 95), but it does not really get unpacked. In a follow-up interview I did with Bizhan in June 2001, I asked him how he really came to know 'who's good at what'. He answered with the following narrative:

> When this RA [research assistant] joined our group, we had three printers in the lab, but we had more PCs. None of the printers were shared, and when he came he easily changed them into shared printers. This was how I initially came to know he was good at computers.

Another interesting point that came up in the follow-up interview with Bizhan was the distinction he made between two different types of solving one's problems in the lab. The first way is to go and do a lot of readings about that issue yourself, which is difficult and time-consuming. The second is to look around in the lab and ask people if they know the solution. This he referred to as the 'easy way', which was what he used quite often. This 'easy way' of learning is another aspect of the 'hands on' and 'situated' nature of learning in PhD education.

As demonstrated in the above quotations, interactions seemed to be a very important element of communities of practice at least for the engineering students under study. Interactions are important in that they often help students know about the areas of expertise of each other, so that they can refer to each other when there is a need. As I will point out in *Chapter 9*, this by itself would be a very good topic for further research in which a range of micro-analytic techniques of interactions taking place among members of a community of practice would probably help clarify many aspects of communities of practice, one being the sort of techniques members of a community of practice use in their everyday interactions to achieve their functional ends. I will come back to this theme later when I explain the goal oriented nature of team working in engineering.

The concept of scaffolding discussed in *Chapter 2*, and specifically the concept of the zone of proximal development (Vygotsky 1978, p. 86) focuses on the help one might receive from the more capable peers, or as put by Lave and Wenger (1991) the 'old timers'. This idea was often referred to in my interviews with supervisors and students:

> … they can learn from others, from other students, from their peers…they may be one or two years ahead, so they have done some more work in that area. So they go and learn from them, you know, how to do things. And so, many times students learn more from other students who are one or two years ahead of them, because they are with them all the time in the lab and so there's more interaction. And… so that's another curve for learning, his interaction with other students who are working more or less in the same area, and can help them, and so they can initiate them into that type of research activity (Dr.e1, engineering).

The type of things novices learned from old timers in engineering was different in character from the type of things they learned from their supervisors. As Dr.e1 put it, novices learn the general guidelines from their supervisors, and the more concrete from their more experienced peers:

> The supervisor normally gives more general guidelines…and the other students give more detailed, you know, how to do the simulation, the programming in the C-Language, and you get bogged down they will help you, the computer, there's something wrong with the computer they will debug it for you, things like that. So,…, so it's more everyday and more detailed. So normally they get help from other students in details, but the general stuff they're getting from the supervisor. So that's the main difference (Dr. e1, engineering).

As another example of scientific and technical collaboration among the engineering PhD students, I would refer to a narrative told by one of these students:

> I remember that once a student who needed help with using the C Language sent emails to everyone in the department. And he had received so many answers that he had to send another email to thank people and say he has managed to find someone to help him (Shahab, engineering).

Yet another example from the engineering students would be that of Saeed whom I have already mentioned. He had actually engaged in the design and implementation of an instrument with the help of a group of people in his section. As he mentioned, he would never have been able to do all that work without the help he had received from the head of the section, staff, students and technicians in his section.

It is also important to note that not only did the person receiving the help benefit from such collaboration, but also the person providing the help achieved a higher level of learning. In fact, not only did the supervisors refer their PhD students to each other for this sort of collaboration, but they were also aware that by engaging them in teaching undergraduate students they would achieve a higher level of learning:

> I also think it's very important that [PhD students] actually help teaching undergraduate students, so that they all teach undergraduate students, and they have to be trained as a graduate teaching assistant, and that then means that they can assist with tutorials. And the reason for that, you will only know your subject well if you can actually listen to somebody who doesn't know it, and actually help them to understand it. And that's why we do it that way (Dr.e3, engineering).

The type of engagement and learning with regard to the social science/humanities students I interviewed were different from those in engineering in certain respects. The first difference was in that the social science/humanities students usually tended to work on isolated projects, or projects that were not similar enough to need close collaboration. In other words, the sorts of projects the social science/humanities students worked on were individual, whereas most engineering projects had an element of teamwork. As a result, the type of help they had received and the type of things they had learned from other students were usually a set of skills they needed to perform their individualistic projects. For instance, most of these students mentioned the type of support they had received in learning how to work with computers:

> The second experience is about using computers. In fact at the beginning, I was not familiar with using the WORD, the computer, the Internet, nothing. And I learned all these things from my friends (Reza, social science/humanities).

Farhad, another social science/humanities student, had a similar experience, as he expressed below:

> I didn't know anything about computers the first day I came here. And I asked other students and learned from them (Farhad, social science/humanities).

The individualistic, non-teamwork feature of the social science/humanities projects is more vividly expressed in the following quotation:

> I have this feeling that everyone is going their own way. So comments and criticisms made by other students are useful only to a limited extent. So these are not very reliable (Farhad, social science/humanities).

However, as I will explain in some detail below, the social sciences/humanities students often participated in seminars, which up to a point compensated for lack of team based projects in their field.

5.3.2.1. Seminar Culture and Team Culture

It seems that there were two distinct cultures available in the social science/humanities and engineering sites I visited, a teamwork culture in which students learned many things from each other, and a seminar culture in which students convened to talk about their projects. On the basis of the ethnographic data I have collected it seems that both types of cultures were present in the social science/humanities and engineering fields. However, the seminar culture was more dominant in the social science/humanities, with the team culture being more dominant in engineering. The overriding difference between these two cultures was that in the team culture students learned many things from each other through informal interactions in their working space, while in the seminar culture, students became familiar with each others' projects in somewhat formal meetings. The other difference was that in the team culture students often acquired their immediate needs in a situated and embedded manner, whereas in the seminar culture the possibilities for

issues to be embedded and situated were not very high. Later in this chapter when I undertake to examine two documents for research training in the social science/humanities and engineering, we will see that both the team culture and the seminar cultures are attended to in both these fields.

The lack of close collaboration in the social science/humanities PhD projects was compensated for to a certain extent by departmental seminars and discussion groups. Both Reza and Farhad, two of the social science/humanities students, often participated in the group discussions and seminars held in their departments. These acted as forums through which they came to know about other projects going on in their departments, a range of methodologies, and different theoretical perspectives.

> So in this course I became familiar with other PhD students and their topics. … there is a departmental seminar, which is weekly, and in each seminar usually a professor delivers a lecture about a topic … relevant to the existing discourse in the academia (Reza, social science/humanities).

In contrast, seminars did not seem to have the same function for the engineering students, as I found in the two follow-up interviews I did with two of the engineering students, Bizhan and Farokh, in June 2001. Bizhan had attended only two seminars over three years. These seminars were more or less informal in which his supervisor and fellow students convened and each student would give a brief description of their research. Bizhan had observed that the sort of interaction going on in these seminars were usually questions students asked for clarification or for better understanding the work of the presenting student. He had also observed that there were really no 'comments' in the sense of debating what the presenter had done, or what they could do to improve their work. The only person who made this sort of comment was the supervisor. In contrast, in the social science/humanities fields, seminars were forums

through which people taking part in the seminars debated the theoretical and analytical frameworks of the presenting student, a scene very much like 'a test', as described by Dr.h2, a social science humanities supervisor.

Farokh, another engineering student, had attended only one seminar in which he had presented a progress report for two years of his studies. The project he was engaged with was a team project concerning making a specific microchip, and different aspects of this project were being carried out by three institutions: two universities, including his own, and an industrial firm:

> Sometime ago the three parties engaged in the project gathered in a meeting to review the progress they had made. My supervisor and I, together with another student went from our college to attend that meeting.

It was in that meeting that Farokh had talked for about twenty minutes about his own share of the work. He said there had not been any comments or even questions because the nature of each aspect of this project had been so specialised that no other person knew much about the other aspects of the project. He added that some people from the other two institutions, for example, were working on the chemical and physical properties of the material to be used in the production of the microchip, whereas he was working on its electronic features. As a result, he did not know much about the chemical and physical properties the other people were working on, and they did not understand enough about electronics to give comments or ask questions when he was presenting his work. This indeed does not seem a promising picture for team working, but it reflects the fact that team working, although effective in providing for situated learning, does not always unfold in an unproblematic way.

There is good reason to investigate the factors that lead to effective team working, which is of course outside the scope of the present study.

In sum, it seems that a team culture was more prevalent in engineering while a seminar culture dominated in the social science/humanities sites I studied, although both cultures were present to some degree in both fields. However, the quality of the seminar culture in engineering may be quite varied. On the one hand seminars may be informal meetings for fellow students to talk about their projects, and on the other hand they may be sessions to examine the progress of funded projects. In neither of the two engineering cases was there a discussion element in the seminars. This is in contrast with what I found in the social science/humanities seminar culture. One of the social science/humanities supervisors, for example, was unhappy about the sort of discussions and debates occurring in their departmental seminar, specifically by members of staff present in the seminars:

> [In seminars] whether you like it or not there's a certain sort of, you know, authority power element. So we organise post fieldwork seminars which is very useful, and they become formal trials …that people…someone back from the field has to perform…has to present a paper…er…for…approval as it were, you know it is supposed to be a helpful seminar where we have students work through some of their ideas, it comes to be a test. So we try to…I don't know what's going on at the moment, but when I was running this departmental seminars, I tried to encourage students to have their own seminars with no faculty effect (Dr.h2, social science/humanities).

The overall argument I am making here is that a team culture is more effective than a seminar culture basically because it provides for not only contextualised, embedded, informal learning, but on top of that 'goal oriented' learning [Skehan, personal communication]. In fact the team culture in engineering is such that members of a team encounter 'problems' which they need to solve. This creates a 'goal' for them

which necessitates that they interact with others to solve their problems. The engineering students learn in this 'goal oriented' and 'hands on' culture. This is not necessarily the case in a seminar culture. The social science/humanities students usually take part in seminars not because they have immediate problems they need to solve, but because this is usually institutionally required. I do not intend to rule out the positive effect that seminars have as forums through which the social science/humanities students come to know about their fields, but I argue that seminars are not 'goal oriented' in the same way as discussed above because they are not motivated by problems to be solved, and they do not provide for 'hands on' learning.

5.3.3. Lonely Researcher

As I have already pointed out, it seems that many aspects of the theory of communities of practice held for the students I observed, especially for the engineering students. However, there were instances in which even the engineering students seemed to be working in isolation. This could be due to lack of access to funded projects. I am not going to expand on this aspect of communities of practice here, as I will discuss it in detail in *Chapter 7*, but I would like to say that the only computing engineering student that I interviewed found himself very much a hermit, not having much to do with other students. The reason for this lack of collaboration, I argue, was that his project, for certain reasons that I will explain in *Chapter 7*, was not part of a larger funded project. As a result he had found himself in a situation very similar to what one might expect in the social science/humanities. This aspect, of working in isolation, is a situation not mentioned or accounted for in *Communities of Practice* (Wenger 1998).

Nevertheless, working in isolation, in some disciplines such as anthropology is epistemologically necessary in certain phases of the research process. In other words, for being immersed into another culture and gaining an understanding of a foreign culture, one needs to do a solitary fieldwork:

> … in anthropology…the fieldwork is not only going and doing research, also going, you know, developing oneself in one's own understanding of what it is to do research. [Doing research in anthropology] is to come out of one's own culture and immerse oneself in somebody else's culture. And part of that immersion was forgetting one's own language and learning a new language … If you go as far as a team, that doesn't happen (Dr.h2, social science/humanities).

However, in other phases of research, collaboration seems to be necessary. Dr.h2 was very much for collaboration among students when it came to presenting a proposal to do research or discussing the result of fieldwork already carried out:

> When it comes to, you know, actually preparing for fieldwork and discussing the results afterwards, I'm all for … as much students exchange as possible. We do our best to kind of encourage this (Dr.h2, social science/humanities).

Dr.h2 further drew a seminar culture environment by adding that there were weekly regular seminars running in his department. He described these seminars as sites where "people, …, discuss[ed] their ongoing research, the chapters they'[d] written …" and where students learned from each other, as he believed that "students learn far more from each other than they do from their teachers". Therefore, based upon my interview with Dr.h2, it can be concluded that research in anthropology can be roughly divided into three phases. In the first phase of the research, the students present their proposals for their projects in a seminar in which they expect to receive feedback on their projects. This cooperative phase is followed by a solitary activity in which students do their fieldwork, which is itself followed by another collaborative

activity in which students discuss their results with other students and staff in seminars.

Another sort of loneliness I observed in my ethnographic data emerged not necessarily from the nature of the discipline, but from the specific situation of the students. For instance, one of the social science/humanities students I interviewed was studying history. He was an extramural student who spent only three months each year in the UK. He had absolutely no contact with other students. He only exchanged emails every now and then with his supervisors, and met them two or three times each year while he was in the UK.

The sort of loneliness emerging from the nature of the social science/humanities disciplines was more or less absent in engineering. However, I encountered another type of loneliness in engineering. This sort of loneliness was a solitary experience resulting from the workload one should do as part of a PhD. As the following engineering supervisor pointed out, many PhD students forget they are social beings in the ordinary sense, and devote all their time and energy to their studies. However, he believed that PhD students should also maintain their social relationships:

> But it's very important to remain human, maintain whatever hobbies you had before this experience, so that you will also have time off this experience. … So you need to keep participating in this [social process]. So I see a number of the students to abandon their private lives when they engage in their PhD courses. I see them to [*sic*.] get isolated … some of them get lonely (Dr.e2, engineering).

Another similar case was Armin, who was studying mechanics. As I will discuss in detail in *Chapter 7*, Armin had rejected being assigned a topic by his supervisor and had insisted on working on a self-selected project. That was why he had very little

contact with other students in his section. He attributed this lack of collaboration to two reasons. The first reason is very similar to what we saw with Koroosh, who believed that *personalities and nationalities* are important in student-student relationships, and the second reason is what I refer to as *secrecy:*

> I don't have any problems with the English in our section. But there are some Chinese … [who] think they are doing a project for the NASA. They are very unfriendly even with each other. Maybe it's a cultural thing. In addition, there is nobody working in the same area as I do.

This loneliness is very close to what Shaw (1991) found in his research. He observed: "some [science] students felt isolated because they were working on a topic of their own choice … and had little to do with departmental projects" (p. 193).

In sum, many of the social science/humanities students tended to work in isolation, which was often an epistemological factor. However, there can be cases of lonely researchers even in engineering where one might expect to have PhD students who work in teams or at least on related projects. Two reasons for this phenomenon would be that either some engineering supervisors have no or little access to funded projects, or that the students themselves have selected topics that are far from the interests of their supervisors and other students.

5.3.4. Competition

The idea of working together and learning from each other does not always seem to be as straightforward as Wenger (1998) elaborates upon, or as optimistic as I have presented so far. There are negative aspects to this issue as well, such as reluctance to cooperate or even *competition.* In fact, as I have already explained, cooperation among research students as a community of practice seems to be a strong factor for

making that community run smoothly as well as for the overall coherence of the community. In a co-operative environment PhD students learn from each other and help each other to overcome their problems. However, this does not turn out in exactly the same way in the real world. In fact, there are certain elements in a community of practice that prevent it from running smoothly. One of these elements can be argued to be competition.

One of the engineering supervisors was very concerned about this issue. He found it very difficult to ask his PhD students to work together:

> … something that seems to me is that students seem to think that there must be a prize for the best PhD thesis or the one who does it most quickly or something like that. I've got a number of PhD students who are all working on very similar …erm…aspects of rock mechanics. And in fact, as a number of different facets to the work which actually cross between students. But they're not doing the same thing, but the student might be developing a mathematical technique, which is useful not only for him but also for his colleague as well. And it's very difficult to actually say to students, 'will you please talk together, will you please try and share your ideas?' There are no prizes for doing it all yourself (Dr.e3, engineering).

Dr.e3 further believed that lack of willingness to co-operate might be understood in an undergraduate context, but he simply could not understand why research students do not tend to work with each other and have to be "prodded and poked" to co-operate. He believed that co-operation could be very influential in the overall progress of his students, and in fact he pushed them to cooperate:

> And they almost have to be prodded and poked to actually work as a team. … I'd like them to work as a team because they can get so much out of it, but it's difficult to make them do it (Dr.e3, engineering).

In a follow up interview I did with one of Dr.e3's students later, he agreed that there was a sense of unwillingness to cooperate in their laboratory. He mentioned several

reasons for this, one being that different cultural backgrounds may block good relationships among students. He referred to a student from South Asia with whom he did not get along very well. This South Asian student had looked down at him from the beginning, as he considered himself as coming from a more prestigious country, as my interviewee put it. My interviewee further added that this South Asian student was very proud and whenever he wanted to give others any sort of help, he would do so as if others were not as good as him and that was why they came to him for help. This had led to a situation in which neither my interviewee nor that South Asian student liked the other. My interviewee further explained that there were four students in their study room. From among these, one did not use the room very often. The other student was from England, with whom my interviewee had no problem, but he simply could not tolerate the South Asian student.

The other reason my interviewee mentioned for lack of collaboration among students was that everyone was busy with their own work and did not have time for others. In addition, the projects each of them was working on had become so specialised that nobody else really knew enough about it. This might seem contradictory to what I have already pointed out about the teamwork culture of engineering students. But it seems that in the initial phases, students' collaboration is more helpful, as there are many things they can learn from each other. But as they progress, they become competent in handling the tools and resources they need for doing their research, and at the same time their work becomes quite specialised.

I should say that competition is not only present among PhD students in academia, it is also present among the staff. Williams (1993) refers to an article by Steinburg (1977) to show the degree of this latter type of competition:

> Academe, in short, can be a jungle – more terrifying than the real jungle, where predators kill out of a natural need for food. But academic people on the make have an instinct for the jugular that is driven by a deadly combination of ruthless ambition and sheer, malevolent, sadistic pleasure. The demolition of a colleague's paper or reputation consumes an extraordinary amount of time and energy that might best be used by minding one's own affairs or (horrible thought) serving the students.
>
> This unmitigated savagery is accompanied by a climate of fear that, if not neurotically self-generated, is imposed from without by the unrelenting pressure to complete a PhD and to publish within a defined time limit. There is the reiterated admonition that failure to accomplish both ends with result of loss of job. Never mind that the victim may be a dedicated teacher. Without tenure there is no security, and the irrevocable rule is "up or out." To avoid this holocaust, publish anything, but publish. If one can produce reprints, one can conceivably be home free (Charles S. Steinburg 1977, quoted in Williams 1993, pp.46-48).

The above quote, though obviously very harsh, has at least some indications to the truth in it. In sum, as I mentioned before, many important aspects that seem to be ever present in all social contexts have gone unnoticed in *Communities of Practice,* one being competition. It could be said that competition can be regarded as a negative feature for PhD students that obstructs their learning and collaboration. I will come back to this in some detail in *Chapter 8* when I present a revised model of dimensions of practice. However, it could be argued that some degree of competition among experts in academia can act as a positive factor that drives the staff to produce publishable material and enhance the boundaries of their fields.

In the brief account I have provided here, I do not intend to claim that I have covered all aspects of competition in communities of practice, but I believe that this suggests new ways of looking at communities of practice.

5.4. An Analysis of Two Research Training Documents in the Social Science/ Humanities and Engineering

In this section I will elaborate on the *ESRC Postgraduate Training Guidelines* (2001) and compare them with the set of PhD training guidelines from an engineering department. This latter was the only set of PhD training guidelines I could find on the website of an engineering college, although there might be guidelines available in hard copy. Nevertheless, it does not seem to matter, as this section is not intended to be a comprehensive account of the PhD training programs in the UK. Rather, my aim in this section is to outline the similarities between the *ESRC Guidelines 2001*, as typical of the social sciences, and comparable PhD training guidelines which I hope to be taken as typical of engineering departments in the UK. I will then focus on five follow-up interviews I conducted with the same engineering students in June 2001 to explore the extent to which these guidelines are implemented in practice.

The aim of the ESRC (Economic and Social Research Council) handbook is to set out the parameters for assessing Higher Education institutions in the UK that would be considered eligible for ESRC funded studentships. The handbook starts with general comments on the nature of postgraduate training and proceeds to explain in detail guidelines for each specific field of enquiry within the social sciences.

The *ESRC Guidelines* mention two aspects that should be addressed in postgraduate training. The first are "general skills which are not subject-specific" and the second are "personal skills development, often referred to as transferable or generic skills" (*ESRC Postgraduate Training Guidelines*, 2001, p. 13). The first of such skills, according to the ESRC, are required by all social science students regardless of their field of study, and they include skills such as computer skills, word processing skills, and working with data bases available in higher education institutions (p. 13). In the second set of skills, referred to as generic or transferable skills, there is an emphasis on the future vocational prospects of the PhD students. According to the guidelines, most employers expect the PhD graduates to have high standards of skills such as team working, and communication skills, which contribute to their ability in their working life.

Formal training seems to be a major concern for the writers of the handbook, and this is supported with assumptions that are often taken for granted:

> The *Guidelines* emphasise formal training because students are likely to benefit most from training which has been carefully planned and communicated clearly to all concerned in advance (p. 9).

The same argument can be found in the PhD training handbook of an engineering department in the UK:

> Many skills needed for effective research and management today require multidisciplinary inputs and group efforts, which are better done in an organised programme (www.et.ic.ac.uk/Local/phdprogram/training.htm).

I do not intend to argue that the assumptions made in the above documents are right or wrong, but I would like to point out that such assumptions seem to be acting as *black*

boxes (Latour 1987, p. 22), in the sense that they are taken as facts that need not and should not be questioned. The position of such sentences is very much similar to the following description of 'black box' sentences by Latour (1987):

> A sentence may be made more of a fact or more of an artefact depending on how it is inserted into other sentences. *By itself a given sentence is neither a fact nor a fiction; it is made so by others, later on.* You make it more of a fact if you insert it as a closed, obvious, firm and packaged premise leading to some other less closed, less obvious, less firm and less united consequence (p. 25).

This is exactly what has happened to the sentences in the PhD training guidelines above. They make a black box by taking it for granted that "[m]any skills needed for effective research and management today require multidisciplinary inputs and group efforts", and further argue that these "are better done in an organised programme" (www.et.ic.ac.uk/Local/phdprogram/training.htm), which obviously points to formal training. However, once these 'black boxes' are made *unfamiliar* in an anthropological sense, or are 'reopened' , as Latour himself puts it (1987, p.29), they do not seem to hold as the *truth,* but as the ideologies of the people who have written them.

Another feature of the ESRC guidelines is the weight they give to interactions among research students and more capable researchers. The *Guidelines* suggest, "Research students benefit from contact with expert and experienced researchers" (p. 11). Although this is again taken as a *black box* in the sense mentioned in the previous paragraph, it seems it is consistent with an apprenticeship approach supported by the ethnographic data I have collected in my research. As we saw earlier in this chapter, students seem to be learning from each other and from more capable peers, and I would argue that my research provides good empirical evidence supporting this.

The incorporation of formal training in the overall structure of PhD is justified in another section of the *ESRC Guidelines* on the grounds that it provides opportunities for students to interact with one another "for the common purposes of achieving their broadly-based research training" (p. 12). The same argument can be found in the engineering guidelines referred to earlier in this section:

> Individual students and supervisors have learned and taught what was needed as it was needed, often in isolation. … A training programme exists to ensure that research students gain the full benefit of being members of a large and diverse school within the college. The programme also provides an opportunity for PhD students from across the School to meet each other, and students from other years (www.et.ic.ac.uk/Local/phdprogram/training.htm).

If we look closely at the above quote, two points catch our attention. The first is that a comparison is made between 'learning what is needed as it is needed', and 'learning in a formal training context'; and it is argued that the former is not *as good as* the latter. I would like to argue against this position and state that 'learning what is needed as it is needed' is in fact equivalent to 'situated learning', which based on my data and arguments works better than 'out of context' learning. The second point in the above quote is that research training programmes are considered as opportunities where students 'can meet other students', but it is not clear why these meetings are important and if they are goal oriented or not. In fact, as I have already explained in section 5.3.2.1., the 'hands on' nature of team working in engineering, which is congruent with 'learning what is needed as it is needed', is in fact the advantage of a team culture over a seminar culture.

As I have already pointed out, the overarching model for research training in both documents seems to be based on a 'generic/transferable' approach. However, the 'as and when required/ hands on' approach is not ruled out altogether:

> Broadly-based training should enable students to think through how they can use their existing knowledge and skills in different contexts and apply them to a variety of problems; and, *progressively, to identify their own needs for training* (Emphasis added) (*ESRC Guidelines* 2001, p.13).

One important point about the policies outlined in the *ESRC Guidelines* is that they clearly point out that students themselves should select research topics:

> Students should receive training in the management of research that extends beyond project management to encompass the real-cycle of the research process from the initial idea for a research problem, through the development of a research proposal that may attract funding … (p. 15).

I did not find any hint on this issue in the engineering PhD training guideline I examined, and this, I assume, is support for what I will argue later in *Chapter 7*, that topic selection is taken to be part of doing a PhD in the social sciences/humanities, whereas this is not the case in engineering.

It seems necessary to bring in some empirical data from the follow-up interviews and email data I collected from five of my engineering students in June 2001 concerning the research training programs in their departments. I will also refer to some data concerning the same issue in the social science/humanities based on the data I gathered in the year 2000.

It seemed that formal research training was not part of doing an engineering PhD for the engineering students under study, although suggested in the PhD training guidelines I have already referred to in previous paragraphs. None of the five engineering PhD students had participated in any research training workshop. In addition, they did not know of any such workshops in their department. However, they mentioned seminars in which they presented their research to other students. For

instance, Bizhan said there were often six-monthly seminars held in their section, where students gathered in an informal way and talked about their projects. This is further evidence for the presence of a seminar culture in engineering, as I have pointed out in section 5.3.2.1. However, as I pointed out in that section, the team culture seems to be stronger than the seminar culture in engineering. One reason for this would be the relative low frequency of such seminars in engineering compared with that in the social sciences/humanities. Another reason is that many of the things a seminar is supposed to do, engineering students do in their day to day interactions in their labs. For instance, one of the purposes of seminars is that students become acquainted with the 'shared repertoire' (Wenger 1998) of their respective research communities. This purpose is fulfilled in a lab when engineering students interact with one another to solve their day to day problems. However, as I have already argued, the interactions carried out in a team culture in a lab are often motivated by immediate problems students might have with their research. However, this is not usually the case with seminars. Students might attend seminars in order to learn general issues concerning methodology and conceptual frameworks, but they do not often learn specific issues concerning their research.

The M.Sc. classes, however, were mentioned as a possible place which supervisors advised their students to attend. Farokh had attended an MSc. class, but Shahram had not done so although it was recommended by his supervisor. In neither case had the students found such classes to be of immediate help to their research, and as a result were not satisfied with them. This is important in that both sets of the guidelines were differentiating between specific skills of immediate necessity to students and those

that students could learn in case they might need them in future. However, engineering students seemed to be in favour of a 'hands on' approach to training.

Koorosh had participated in a training program in his college, but this was again on a 'hands on' basis rather than a transferable approach to formal training, as is evident from the following email I received from him in June 2001:

> About research training, the only research training that I participated in, called GTA which was for PhD students who want to teach as an administrator in laboratory or do tutorials. In this case they'll show the basic rules of teaching and safety procedure. Without taking this course we are not allowed to help our supervisor or do any administration (Koorosh, engineering).

One of the features pointed out in the *ESRC Guidelines* was the importance of seminars in the overall development of PhD students:

> Research students learn from interacting with their peers in an environment where interests and concerns can be freely exchanged and where they can engage in academic arguments. In avoiding isolation, outlets [institutions] should facilitate such interactions by providing opportunities to bring research students together, for example, through research training events, seminars, and provision of common facilities (p. 12)

In the interviews I did with the social science/humanities students, and based upon my own experience as a social science/humanities student, it seems that the social science/humanities departments in my study have been to a large extent successful in implementing the suggestions put forward by the ESRC.

But how does all this speak to the whole concept of communities of practice discussed in this chapter? It seems that the social science/humanities institutions I have studied have managed to put into practice the guidelines suggested by the ESRC with a certain degree of success. The seminar culture emphasised in the *ESRC Guidelines*

have correctly focussed on an important issue, namely seminars in which research students come to know the 'shared repertoire' of their communities of practice. This has to some extent compensated for the lack of 'mutual engagement' among social science/humanities students.

It seems that there are two curricula for research training in engineering departments. One is a *formal* one outlined in the research training guidelines I have examined, and the other is the *hidden curriculum* which is actually practiced by the people these guidelines are written for, i.e. supervisors and research students. It is beyond the scope of this study to investigate why there is such a mismatch between these two types of curricula, but I would like to mention a few points in passing. First the whole idea of equipping research students with a set of decontextualised tools in case they might need them in future seems to be debatable. As I have argued in *Chapter 2*, learning in embedded, contextualised settings seems to be stronger than a detached form of it. As a result, there should be more empirical evidence that skills learned in a decontextualised setting can actually be transferred to real settings. At the same time, the ESRC's emphasis on seminars and workshops has made it easier for the social science/humanities students to participate in a community of practice and learn from each other. This has made it possible for the social science/humanities students to experience a sense of community in their academic cycles.

5.5. Conclusion

As I mentioned in the introduction to this chapter, Wenger (1998) points out three dimensions of practice that are characteristic of a community of practice. These

include *mutual engagement*, *a joint enterprise*, and *a shared repertoire*. I reproduce below the diagram first I referred to in *Chapter 2*:

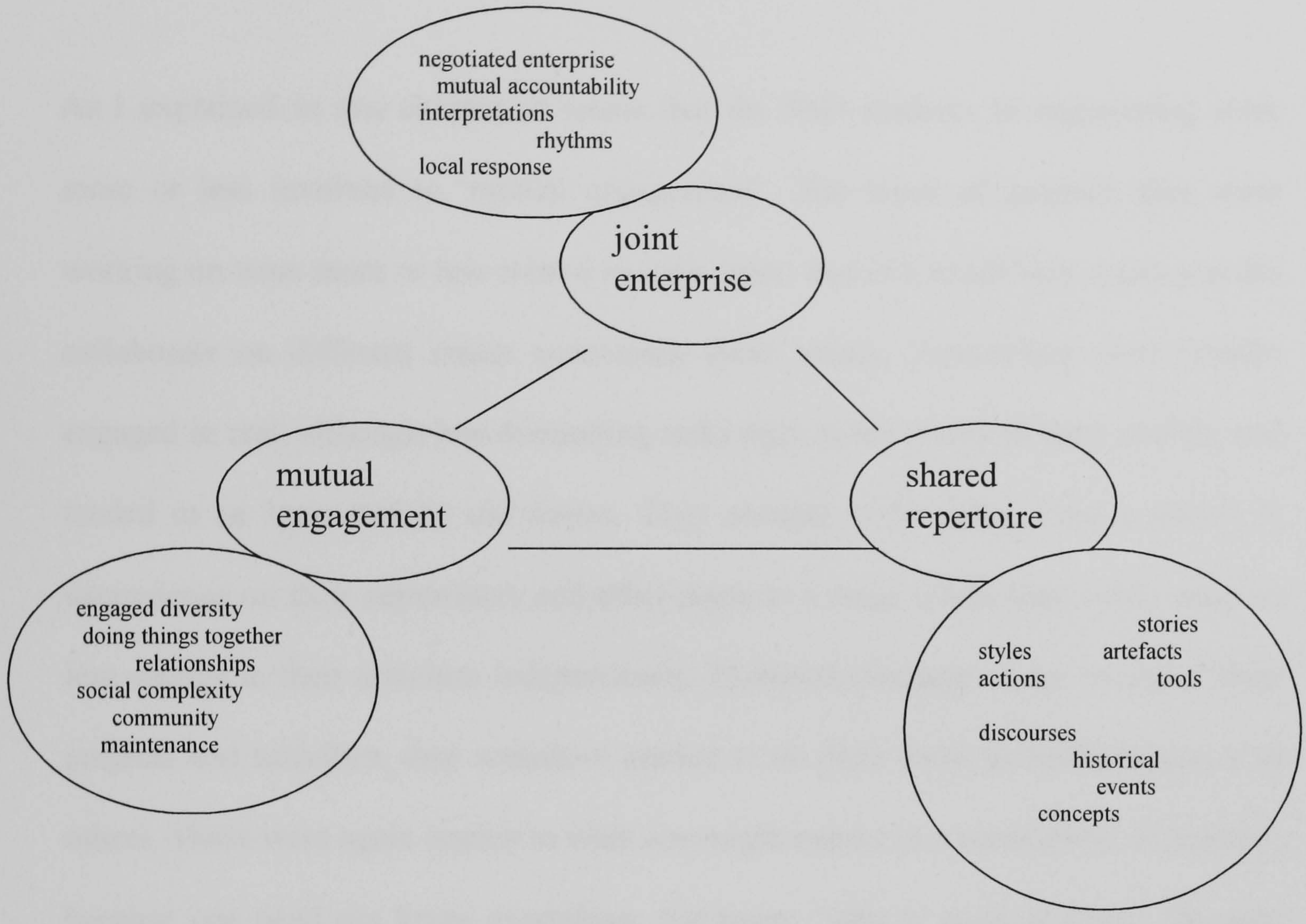

FIGURE 5.1:
Dimensions of practice as the property of a community
(Wenger 1998, p. 73)

As is clear in the above diagram, 'doing things together' and 'relationships' are subcategories of 'mutual engagement', while 'styles', 'discourses' and 'concepts' are representations of a 'shared repertoire'. In the ethnographic data I have collected for this research study, I found traces of most of the components in the practices of research students in both engineering and the social science/humanities fields. However, the extent to which each of the three components above was addressed in these two fields was different. In engineering, because of the prevalence of a team culture, 'mutual engagement' was carved out among the other dimensions of practice,

while in the social science/humanities, a seminar culture was more prevalent, and it seemed that 'a shared repertoire' was a more prominent feature of this community of practice.

As I explained in this chapter, it seems that the PhD students in engineering were more or less involved in 'mutual engagement'. The types of projects they were working on were more or less related to each other, and as a result they could and did collaborate on different issues concerning these issues. Newcomers were usually engaged in real, although less demanding tasks right at the outset of their studies, and tended to be supported by old timers. They seemed to be going from a period of dependence on their supervisors and other peers to a stage where they could more or less engage in their activities independently. However, because of the nature of their projects and activities, they somehow needed to do their work in collaboration with others. These were again similar to what one might expect in a community of practice, because one need not know everything, but know "who is good at what" (Wenger 1998).

This degree of engagement seemed not to be present in the social science/humanities students I interviewed. They all worked on self-selected, non-teamwork projects, and this did not require them to work in collaboration with other students. This was to an extent compensated for by weekly seminars and research training workshops held by departments, which might be seen in terms of another aspect of communities of practices, namely *a shared repertoire*.

Nevertheless, there were references in the data that did not seem to support or at least be covered in *communities of practice.* There were engineering students who were more or less working in isolation without much contact or interaction with other students. I would argue that this was because these students were either working on topics that were not among the main interests of their research groups, or their projects were not related to funded projects and as a result tended to be individualistic rather than team-based.

In addition, there were affective factors involved in the data I gathered that were not addressed by Wenger (1998). I found *competition* to be a strong force in some of the engineering sites I visited. This phenomenon was in fact working against the team-based collaborative efforts needed in the engineering research groups. This was so strong in one of these research groups that one of the engineering supervisors talked at length about it and said it created a real problem in his group.

Another affective factor not considered adequately in *communities of practice* but present in my data concerned the cultural and personality factors so important in developing working relationships in research groups. Wenger (1998) writes that in a community of practice one should get to know "who is easy or hard to get along with" (p. 95), but he actually does not say that this factor is so strong that it could derail the development of working relationships. As mentioned by two engineering students, they could not collaborate with some people in their research groups because of cultural and personality conflicts.

In sum, the data I have collected seem to be supporting many aspects of communities of practice in the working relationships among engineering and the social science/humanities students and their supervisors, although there are certain areas not fully accounted for in the theory of communities of practice. It seems that more research is required to clarify the factors that actually help or hinder communities of practice to run smoothly. In the next chapter, I will look at the concept of communities of practice from another perspective and will specifically look at PhD students and their supervisors.

CHAPTER SIX

RESEARCH STUDENTS AND THEIR SUPERVISORS

6.1. Introduction

The aim of this chapter is to consider one of the important features of higher education, namely the relationship between research students and their supervisors. The overall framework of this chapter, like the other data-based chapters of this thesis, is based on the constructivist grounded theory framework I have already outlined in *Chapters 3 and 4*. Based on this methodological framework, I gathered qualitative data through interviews with 13 Iranian PhD students and 6 of their supervisors in the fields of engineering and the social sciences/humanities. Eight of the students were in engineering, and 5 were in the social science/humanities. Four of the supervisors interviewed were in engineering and two in the social science/humanities fields. The interviewees were based in 5 different higher education institutions in the UK. Following the rigorous principles of grounded theory, I coded the data thus obtained, and using the NUD.IST software, I categorised the codes. The next stage of my analytical framework was to 'integrate' the codes and look into the inter-relationships amongst the 'bits and pieces' of the data. However, I would like to reiterate that my understanding of grounded theory is in line with a constructivist version of this theory outlined by Charmaz (2000), according to which the categorisation and integration of data are the result of the interaction between the researcher and the data, rather than an objectivist position taken by the first version of grounded theory (Glaser and Strauss 1976) (A more comprehensive discussion can be found in *Chapter 4*).

In the current chapter, I will look at the data I have collected and explore the extent to which my findings are accounted for in the concept of Legitimate Peripheral Participation (LPP) (Lave and Wenger 1991) and the theory of communities of practice (Wenger 1998). As with other chapters, I do not intend to generalise beyond the confine of the cases I have studied, although I believe that such case studies can help us gain insight into the process of academic socialisation in PhD education.

As I have already mentioned in the previous chapter, the present chapter is an extension of my analytic framework of communities of practice, but I decided to devote an entire chapter to the relationship between research students and their supervisors because of the importance it has in the overall success of these students.

It is also important to point out right at the beginning that my sub-unit of analysis in the present chapter is the student-supervisor relationship (see *Chapter 4*, section 4.4). This means that I am not looking at students and supervisors as two separate entities with essential meanings. Rather I would like to argue that these two concepts are dialectical in that they get part of their meanings from the relationship between them. In other words, a supervisor is a supervisor only in relationship to a student, and a student is a student only in relationship to a supervisor. Therefore, it is methodologically important to look at the interrelationship present in this situation (cf. Lyotard 1991 quoted in Kvale 1996).

This chapter, like the previous chapter, will unfold on the basis of the categories in my own data, but I will make references to the related literature as necessary, exploring the extent to which my data can be interpreted with respect to the

analytic frameworks I have worked with, such as scaffolding, initiation, and communities of practice. The first issue I examine is the ways in which the PhD students under study were initiated into their fields of study.

6.2. Initiation

One of the main responsibilities that the supervisors in my study assumed was to initiate new students into research, or in other words, help them start their work as researchers. There seemed to be two distinct strategies in engineering and the social science/humanities fields. In the former, the supervisors usually initiated new students into research by assigning tasks and topics to them, while in the latter, the social sciences/humanities supervisor had students engage in literature review and writing reports.

One of the strategies that the engineering supervisors in this study employed to achieve this aim was to assign relatively easy tasks in the initial stages of research to their PhD students, tasks that were challenging but not defeating. Dr.e1, for instance, asked his students to do simulations, i.e., experiments that had already been carried out by others and were not considered original research. He did this in order to familiarise his students with related books and papers, and data based search, among other things.

Other engineering supervisors under study employed a very similar approach. Dr.e3 had even coined a term for this strategy and referred to it as 'machiavellian':

> ...the first thing I would do is actually…be somewhat machiavellian...in that I would set them short assignments for which I already know the answer. Because

> then I can determine just what level of self-motivation and [*2] deep thought they bring to it. So, obviously if it's a problem that I've been thinking of for a few years, I will be aware … reasonably well of the current state of the arts, and key persons, and things like that (Dr.e3, engineering).

Dr.e3 referred to this initial task assignment as 'machiavellian' for two reasons. The first reason was that he asked new students to solve problems to which he already knew the answer. And second, he was almost certain that his students would not be able to go through the right procedure, and in fact would make mistakes:

> I actually allow them to make mistakes. In fact I almost encourage them to make mistakes, so that I can then tell them what they should be doing (Dr.e3, engineering).

Dr.e3 used this 'machiavellian' procedure to help students 'master' the essentials of doing research, like using the electronic journals and 'getting familiar' with the citation index.

These relatively easy tasks assigned by engineering supervisors to their PhD students in order to help them 'master' the essentials of doing research are actual examples of 'legitimate peripheral participation' (Lave and Wenger 1991). As a matter of fact, the engineering supervisors 'legitimised' their students' entry into the 'peripheral' zones of their fields by assigning these tasks to them. In other words, the engineering supervisors under study were following an apprenticeship model of supervision implicitly, if not explicitly. This is most vividly pictured in the following quotation from another engineering supervisor:

> The assignment of tasks might be… something that needs to be done in the laboratory, that is .. it might be writing a report from existing data, or do a literature search for somebody who's writing a paper…or repairing a computer, or set up an experiment for somebody else who has something to experiment on,

> or baby-sit somebody's experiment, this kind of tasks that are *relatively low in demands but do expose the students to new...to different aspect of what the process involves* [emphasis added] (Dr.e2, engineering).

In sum, the **easy** tasks that Dr.e3 referred to as **machiavellian** were **easy** for certain reasons. One reason was that students were engaged in these tasks to give them **legitimacy** to start their research careers. In addition, the tasks were **easy** in order to position new research students on the **periphery**. And research students were expected to become more independent as they **mastered** and became **familiar** with the practices of their respective communities of practice. These key terms that I have highlighted here are what I believe are the components of Legitimate Peripheral Participation (LPP).

This realisation of the concept of legitimate peripheral participation was also present in the experiences of the engineering students. Bizhan, one of the engineering students under study, had been asked by his supervisor to take part in a research study already underway. This study was being conducted by his supervisor and a senior student, and Bizhan's supervisor had asked him to do part of the work upon his arrival in the department. After this piece of research was over, Bizhan's supervisor had given him his 'real topic' of research. In fact, Bizhan had been considered a 'legitimate' member of the research team, although he had been given a 'peripheral' role (Lave and Wenger 1991).

In the engineering contexts in this study I observed what seemed to be a realisation of the concept of 'Legitimate Peripheral Participation' (Lave and Wenger 1991), in which the engineering students were given roles to fulfil in some sort of mock

research. Therefore, in engineering there was not a clear distinction between 'learning' and 'practice' (Wenger 1998). In other words, the engineering students were often asked to 'participate' in the social practices of their fields right from the beginning. Bizhan (engineering student), among others, had not attended any formal workshops to prepare and *learn* for his research. He had immediately started participating in *practices* of his department. He recalled the way he had started his PhD as follows:

> When I first started my PhD, my supervisor was writing a paper. It was a project on one-dimensional noise signals. The system he was working on was sensitive to noise. He was trying to find a mathematical explanation for this sensitivity. And he asked me to find one. Thus I started my studies. In fact I had no prior plan before coming here. My supervisor asked me to work out a mathematical model to explain why this system was sensitive to noise. I worked out that model and the paper was published (Bizhan, engineering).

The social sciences/humanities supervisors in this study seemed to be following a somewhat different approach to initiation. At least for one of the social sciences/humanities supervisors, new research students were required to have gone through a set of preparatory workshops before they were allowed to start their project, which is indicative of his implicit belief in a separation between the 'practice' of research and 'learning' how to do research:

> Anybody who doesn't come from our department and that might be from another department in the country or from another country, we obviously try before we accept them to get some idea of what their background is and what we might need in terms of extra coursework or training or whatever it is, in order to familiarise them with what we would expect. And so there is a very wide range, perhaps, that some people we say well look, we can't accept you to our course until you have done a one-year MA conversion course. And the other is we say, you know, your idea is very close to our understanding, we recommend you do another methods course or a course in general theory or something like that. Or we think you'd have to take some sort of exam. So there`s a range between what we recommend in terms of where people come from *before they get involved in the actual research* [emphasis added] (Dr.h2, social sciences/humanities).

The social science/humanities supervisors also asked their students to do literature reviews, attend seminars and write reports. I believe that these initiation strategies, though different from what I observed in the engineering fields, were also realisations of 'Legitimate Peripheral Participation'. This is because the students were given the chance to do these relatively 'easy tasks', and were also given enough legitimacy to take part in seminars.

One of the odder initiations I encountered in my study was that of Babak, a social science/humanities student. Babak's supervisor had asked him in their first meeting to provide the list of chapters he was going to write for his thesis. He had written a first draft and discussed it with his supervisor in their next meeting. In fact, they spent the first few meetings fixing the title of the chapters he was going to write in his thesis. This somehow odd type of initiation strategy does not seem to fit anywhere in the apprenticeship model. Unfortunately, despite many requests, I was unable to arrange an interview with Babak's supervisor to probe into this issue further and explore the reasons behind this sort of strategy.

In sum, one of the types of relationship between the supervisors and the students I interviewed was that of an 'old timer' and a 'newcomer'. In such a relationship, the supervisors initiated newcomers to the practices and 'Discourses' (Gee 1996) of their fields of study. Although the supervisors in both engineering and the social science/humanities seemed to follow an 'apprenticeship' model, in engineering there was a stronger link between the concept of Legitimate Peripheral Participation than in the social science/humanities fields. In engineering there seemed to be a closer link between learning and actually engaging in practices of the field, consistent

with the concept of learning in the theory of communities of practice (Wenger 1998) and the concept of Legitimate Peripheral Participation (Lave and Wenger 1991).

6.3. Scaffolding

One of the issues I encountered in my interviews with supervisors and students was a 'scaffolding' (*Wood et al.* 1976) procedure supervisors seemed to be following in their roles as supervisors. In this section, I will first refer to the literature on the concept of 'scaffolding', and then I will bring in some data to explore how these speak to the theoretical framework.

One of the main roles of supervisors is the scaffolding they provide for their research students. The word scaffolding has often been used in the literature to refer to the support provided by 'old timers' to 'novices'. As I mentioned in *Chapter 2*, the idea of scaffolding is an extension of Vygotsky's (1978) concept of the Zone of Proximal Development (ZPD). According to Duveen (1997), "the metaphor of apprenticeship is employed to give concrete expression to Vygotsky's idea of the zone of proximal development" (p.80), which is defined "as the distance between a child's 'actual developmental level as determined by independent problem solving' and the higher level of 'potential development as determined through problem solving under adult guidance or in collaboration with more capable peers'" (Vygotsky 1978, p.86, In Daniels 1996, p.4).

The idea of scaffolding has also been proposed as being close to mentoring in cognitive psychology (Brown et al. 1989). According to this perspective, " the mentors (1) 'model,' by making their tacit knowledge explicit and revealing

the problem-solving strategies; (2) 'coach,' by supporting students' attempts to perform new tasks; and then (3) 'fade,' after having empowered the students to work independently" (Brown, Collins, Duguid 1989: 39, Quoted in Belcher 1994, p. 24). I will come back to this issue later in this chapter and see if supervisors actually 'fade'. I will argue that research students actually need their supervisors in different ways for different 'stages' of their research. I will also argue that the picture drawn by 'the mentor-mentee' concept above implies a unidirectional relationship between supervisors and students, while my assumption is that this is actually a bi-directional relationship (cf. Morita 2000, mentioned in *Chapter 2*), one in which the student actually gathers and offers new findings to their supervisor. This was also evident in my ethnographic data. In the majority of engineering cases where a funded project was available, the supervisors used the findings arrived at by their students to proceed with the bigger project and to write papers on it. Bizhan, for example, had contributed to the publication of a paper by formulating a mathematical model for a research project already under way. His supervisor had then used this mathematical model to complete the project and publish a joint paper on it. Farokh and Ali, (engineering students), too, were taking part in funded research projects, the findings of which were used in bigger projects and paper publications.

Another concept very similar to scaffolding is 'Legitimate Peripheral Participation' or LPP for short (Lave and Wenger 1991; Wenger 1998), already discussed in detail in *Chapter 2*. Each of the terms of this concept is analytically important in that it gives us a clear idea of what this concept means. The focal point of this theory is that it situates learning in '*participation*' in the social practices carried out by members of a social community rather than in individual cognitive aspects of learning.

However, I do not believe that this emphasis on social participation rules out the cognitive aspects of learning. On the basis of this concept, 'newcomers' to a society are given '*peripheral'* tasks to perform, tasks that are real and relatively easy to perform. Newcomers are also considered *'legitimate'* members of their target communities. The following quote will help us understand this concept better:

> Learning viewed as situated activity has at its essential defining characteristic a process that we call legitimate peripheral participation. By this we mean to draw attention to the point that learners inevitably participate in communities of practitioners and that the mastery of knowledge and skills requires newcomers to move towards full participation in the sociocultural practices of the community (Lave and Wenger 1991, p. 29).

Wenger (1998) later explained the ideas of 'peripherality' and 'legitimacy' in the following way:

> Peripherality provides an approximation of full participation that gives exposure to actual practice... to open up a practice, peripheral participation must provide access to all three dimensions of practice : to mutual engagement with other members, to their actions and their negotiation of the enterprise, and to the repertoire in use... (p.100)
> In order to be on an inbound trajectory, newcomers must be granted enough legitimacy to be treated as potential members. If a community like that of claim's processors rejected a newcomer for some reason, that person would have a hard time learning (p. 101).

Therefore, peripherality means participating in the actual practices of a community, but the degree of this kind of participation is not as high as full members of the community are granted. And legitimacy means that newcomers are accepted as members of the target community. The following diagram pictures these concepts visually:

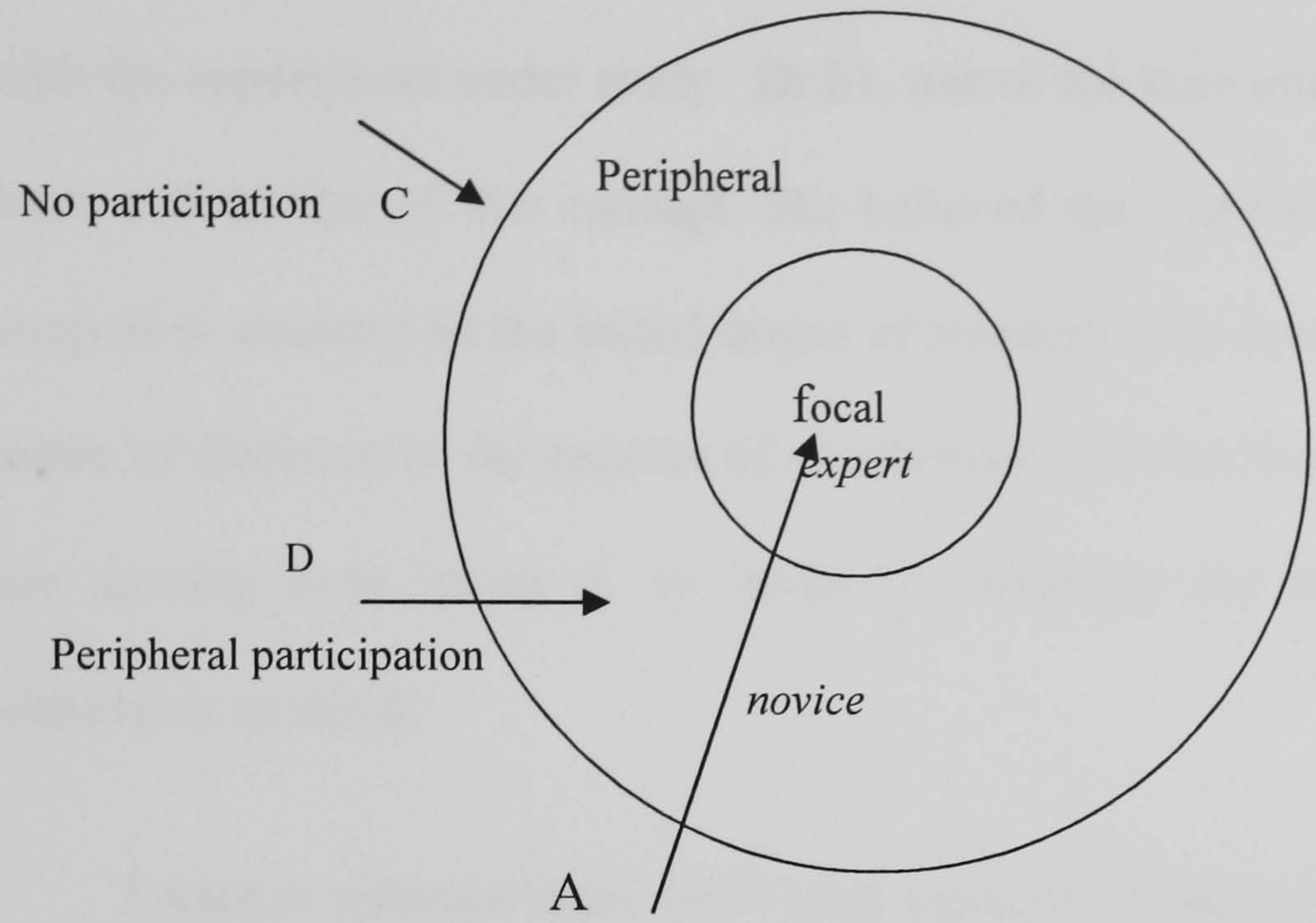

FIGURE 6.1. Legitimate peripheral participation (Adapted from Colwell 1999)

The diagram consists of two co-centric circles, with the outer circle showing the 'peripheral' activities and the inner circle showing the 'focal' activities of a 'community of practice'. Arrow C indicates a view of 'transmission', which I argue is where learning takes place without actually taking part in the social practices of a community of practice, while arrow D indicates where learning takes place as a result of participation in the social practices of a community of practice (refer to *Chapter 2* for a more detailed discussion). The third arrow in the diagram shows the 'inbound trajectory' from novice to expert status. On the basis of this diagram, which is based on Lave and Wenger's (1991) concept of Legitimate Peripheral Participation (LPP), 'peripheral participation' in the social practices of a community of practice is a prerequisite for gaining expertise in that community of practice. As we will see below, this concept was to a great extent materialised in the practices of the engineering and the social science/humanities supervisors under study.

The concept of scaffolding, even the term itself, was often used in the interviews I did with the supervisors under study. Dr.h1, one of the humanities supervisors, seemed to have a clear idea of this concept. She believed that supervisors should provide more support to students in the initial stages of research. She thought that there should be a sense of direction in the process of supervision and that the student should know they are moving from 'point A' to 'point B', although she did not have preconceived objectives in mind:

> I want to reiterate that I don't have a preconceived point B. But I do want to get somewhere by the end of the session. And it may be in some sessions that the student drives it along, and I can just make suggestions and agree, or I may be able to see that there's still a little bit of problem, and I don't need to be more directive (Dr.h1, social science/humanities).

Dr.e1, an engineering supervisor, had a similar idea and believed that going through a 'step-by-step' procedure was necessary:

> So just step by step, either if you don't go through this gradual step by step procedure, they may get lost altogether, they don't know how to start, how to do it .. and just.. they just get lost despite the fact that they have been very studious (Dr.e1, engineering).

As is clear from the above quotation from Dr.e1, this dynamic process of scaffolding is so important to the overall success of research students that it overrides aspects that might seem to be more important such as 'studiousness'.

Although the supervisors under study were ready to offer more help in the initial stages, they expected students to become more and more independent from them and produce new ideas themselves:

> I expect them to be creative and to come up with their own ideas. Not just stick to my own ideas, but also on top of that to initiate new ideas (Dr.e1,

engineering).

The above quotation from Dr.e1 can be regarded as an instance of moving from 'periphery' to 'mastery'. If we go back to Figure 6.1, we can see that 'newcomers' to a community of practice are expected to gradually take on more responsibility and move from the outer layers of the community in question to the inner layers. Therefore, we can see that the supervisors under study were following an apprenticeship approach to their supervision practices, although implicitly.

Although the quotations from the above supervisors seem to suggest a simple linear progression from dependence of students on their supervisors to independence from their supervisors, Dr.e2, one of the engineering supervisors, looked at this issue in a special way. He believed that the mechanism of the scaffolding procedure is dependent upon the readiness of students:

> …And progressively releasing the student from the harness of task assignment and expecting more and more initiative, and independence, and then there are many things that I have done, not always intentionally, which is giving more liberty to the student, which is always good. And if the student is responsive I will give them more liberty. If the student has not been responsive, doesn't seem to be ready to get the liberty, it's back to more task wised assignment. So it is a progressive that goes actually back and forth … (Dr.e2, engineering).

In other words, it may well be the case that even in the final stages of the PhD, students might be very dependent on their supervisors. This situation is understandable if we look at doing a PhD not as a single process, but as the combination of several processes, which I roughly categorise as: formulating a researchable topic, collecting data and reviewing the relevant literature, working with data, putting data and theory together, and writing the thesis. I do not want to argue

that the above stages come one after the other, but quite the contrary, I would like to say that, at least in the social science/humanities fields I studied, almost all the above components occur at the same time or at least substantially overlap. However, during the period of doing the PhD, each of these components, i.e., formulating a researchable topic, etc., receives a higher degree of emphasis. In other words, during the first few months of doing the PhD, students' efforts are focussed on finding a researchable topic, although they also review literature and may collect and analyse a little bit of data. At the end of the PhD, students mostly focus on writing the results, although they also analyse data, review literature, and even collect more data to fill in the gaps they might have in their research.

Although, there were similarities between the scaffolding procedures in the social sciences/ humanities and engineering contexts I studied, there were differences as well. One of the important differences between these two was that the social science/ humanities students tended to go back to their supervisors in different stages of their research studies, but in the case of engineering, the senior students would take on some of the responsibilities of the supervisors and supported each other and the less advanced students. This is evident in the following quote from Koorosh in his account of variations he had observed in his time in college:

> Therefore we had more meetings at the beginning, especially during the first year. Then he told me that I should reach a level when he could give me more independence little by little, so that I could supervise other students myself. So now after 1.5 years we still have meetings , but it's no longer that he tells me what to do , rather I report to him what I've done (Koorosh, engineering).

The idea in the above quote from Koorosh is also present in the following quote from

Dr.e1:

> But at the beginning, of course, I would like to help them anyway. But now that he [one of his students] is in the third year, you know, if he has any problems with programming, he doesn't come to me, he goes to, for example, the RA, the research assistant. But at the beginning of the first year he would have come to me all the time (Dr.e1, engineering).

I should also add that the relationship between a supervisor and a student does not always seem to be unidirectional in which a supervisor is the one who 'gives' and the student the one who 'takes'. Rather, as the student becomes more stable academically and gets familiar with the 'Discourses' (Gee 1996, 1999) of their discourse communities (Swales 1990; also cf. *Chapter 2*), a bi-directional process can be observed. In such a process, the supervisor is in some respects informed by the student. A similar finding was also reported on academic language socialisation:

> In short, the findings of this study seem to suggest that academic discourse socialisation is not a predictable, entirely oppressive, unidirectional process of knowledge transmission from the expert (e.g., instructor) to the novice (e.g., student) but a complex, locally situated process that involves dynamic negotiations of expertise and identity (Morita 2000, p. 304).

In the interviews I conducted with supervisors, an engineering and a social science supervisor referred to this bi-directionality. Dr.e3, an engineering supervisor, used a mathematical concept to explain this:

> And that's when the student first arrives, erm… they will know …5% of the problem and … the supervisor will know 95% of the problem. In other words, I as a supervisor would know what it is that I think ought to be investigated, the students may just know that is a field of rock mechanics. In three years time, when we get to the end of it, the student-supervisor relationship is changed completely. They are then not only my equal in terms of their academic attainment, but in fact they are by definition the expert on that particular field. And then, although both the supervisor and the student have learnt an awful lot more about that particular problem, it is the student who knows 95% of it and the supervisor who knows 5%. So the roles are reversed (Dr.e3. engineering).

Dr.h1, too, referred to a similar conception and believed that the student and the supervisor are not located on different extremes of the expert-novice continuum, but somewhere towards the middle of it:

> I see it a bit like an elastic piece. And there will be sometimes , of course, when, erm, the student leads; in fact , I hope, most of the time , especially after the…. initial six months, I'd say. So it becomes…there becomes more equality, becomes more of a dialogue. But nonetheless, I would like to repeat that the supervisor is supposed to be the one with a little more expert knowledge, and may … often be the one …scaffolding from above , as it were. There comes a point here when erm….the two points on that continuum will be much more equal. So it's not always novice and expert. It will change according to the degree of knowledge and the confidence that the student has.

In sum, both the frequency and the quality of supervision meetings might vary during the course of the PhD. In the initial stages there is usually more support from both the social science/humanities and engineering supervisors. As the student gains more expertise in each stage of research, they become more independent. However, this route from dependence to independence has its own ups and downs, but it is ultimately progressive.

6.4. The Supervisors' Role in Inter-Student Cooperation

In my interviews with the engineering supervisors and students, I found that the supervisors had a role in fostering cooperation amongst the students. These supervisors often saw cooperation as a strong element in the success and progress of their students. However, some students did not seem to believe in this. Some students had benefited from this role of the supervisors while others tried to refrain from it. I have written about the reasons and the effects of this lack of cooperation among students in *Chapter 5*. I will also talk about the implications of this issue for the

theory of Communities of Practice in *Chapter 8*. In this section, I limit my discussion to the role of the supervisor in inter-student cooperation.

Koorosh, an engineering student, had observed that his supervisor often asked students to cooperate with one another. In particular, his supervisor shared findings of each of his students with all the other students in his department. His supervisor emailed new computer programmes developed by students to all other students in case they might need them. So whether the students wanted to or not, their work was shared among all the other students.

Bizhan, another engineering student, had a more or less similar experience to that of Koorosh. His supervisor often sent students to each other to work together and learn from each other. One of the strategies used by his supervisor was to identify the strong points of his students and refer to them other students who needed help on those points.

Forokh, another engineering student had been asked by his supervisor to go and talk with an RA who was going to leave the department. The purpose of this was to make Farokh familiar with the work of that RA so that after his departure, Farokh would be able to follow on what he had already done.

In general, the engineering supervisors believed that students would progress more if there were some degree of engagement among them. However, they had noticed that some students do not have this conception on cooperation:

> It's very difficult to see why they [the students] insist on sitting and working by themselves. And they almost have to be prodded and poked to actually work as a team. …I'd like them to work as a team because they can get so much out of it, but it's difficult to make them do it (Dr.e3, engineering).

The social science/humanities supervisors saw their own role as mostly encouraging students taking part in seminars and workshops. They saw this as the main place where students could come together and learn from each other. As I have already argued in *Chapter 5*, the team culture is prevalent in most engineering fields and the seminar culture in the social science/ humanities. One could argue that engineering supervisors are mainly responsible for the team culture, while the social science/humanities supervisor being so for the seminar culture. However, it could also be argued that there is a whole range of interrelating factors involved in the prevalence of either of these cultures in these two fields that needs further research.

One of the points I noticed in the two fields of engineering and the social science/humanities was that the engineering supervisors often encouraged their PhD students to work together, while there was not this degree of emphasis on inter-student cooperation in the social science/humanities. This is at least partly explicable in terms of different conceptions of what the PhD process involves in these two fields, one being that research students in engineering are usually part of a team of researchers and their cooperation seems to be essential for the overall progress of their teams. In contrast, the social science/humanities students are considered as solitary researchers who should do an 'independent' research. In other words, what seems to be quite 'legitimate' in engineering such as sharing programmes, collaborating in collecting data, and sometimes even in writing the outcomes of the research, might be considered as 'illegitimate' in the social science/humanities. In fact, as I

have already mentioned in *Chapter 5*, Dr.h2, from the social sciences, believed that doing fieldwork in his field necessarily should be solitary rather than being carried out in the framework of a team.

The idea of doing a PhD as a lonely researcher in the social science/humanities fields has been referred to in the literature as well. Johnson *et al.* (2000), for example, approach the concept of the 'PhD as an autonomous enterprise' from a feminist perspective and argue that doing a PhD specifically in the social sciences and humanities has traditionally been equated with concepts of a lonely researcher working on his own (a male figure), and in close relationship with his supervisor. They argue that with the 'mass higher education' system (Yeatman, 1998, p.23), there should be more room for a training component in doing a PhD. The PhD Review Working Group of the University of London (2001) also refers to the history underlying the PhD process in the University of London, when "in some subjects at least, [the PhD] could be a relatively private and unaccountable matter between the supervisor and the student" (p. 3). In contrast, Shaw (1991) found that science research students often worked in teams, which I have already referred to in *Chapter 2*:

> [science students] are not working in isolation, as arts dissertation writers sometimes seem to be, but in a community. The only essential interaction is with the supervisor, but there are also contacts with other departmental staff members, fellow students inside and outside the department, and outsiders at other universities and in industry and government (p. 192).

In sum, the engineering supervisors in this research seemed to be more willing in encouraging their research students to work together, which is partly explicable in terms of the nature of their field, as the nature of the field is such that makes it

impossible *not* to work together. The social science/humanities supervisors too tended to be encouraging students to work together, but this was usually at the level of suggestion rather than actually pushing them to work together. This could also be explained in terms of the different conceptions of what constitutes the PhD process in these fields. It should also be noted that *working together* might have different meanings for engineering and the social science/humanities. In the former it meant engaging in tasks to solve an immediate problem. In the latter it meant something like having discussions in seminars though not necessarily out of need to solve an immediate problem.

6.5. Assignment of Topics

I will discuss the issue of topic assignment in detail in *Chapter 7*, and I do not intend to give a full account of this here. However, it seems necessary to briefly look at this issue as one of the main relationships between supervisors and research students. I found two main trends in the choice of topics in my interview data. One trend, mostly prevalent in engineering, was the practice of supervisors assigning research topics to their research students. I referred to this as 'topic assignment'. This was observed in the field of engineering. The counterpart of this situation was that research students themselves were considered to be responsible for choosing their topics. This situation was characteristic of most social science/humanities departments.

In this chapter, I would like to give an account of the types of topics available to engineering students in the departments I visited and see how these differences might lead to different types of relationships between students and their supervisors. Based on the interviews I did with the supervisors and students in this field, I

categorised the type of topics available to engineering students as: 1) supervisor topics; and 2) students' topics. The first category includes: a) topics that are part of the funded projects of the supervisor; and b) topics that are not part of the funded projects of supervisors but which are interesting to supervisors, and that they themselves have never had the time to research:

> My first priority is if a student has their own topic, bring it in. If they do, I will try to adapt it… to make it also interesting to me so that we have a common footing. If they don't, and that's usually the case, I will choose one from my running research grants as the first priority as I need manpower to do these. And as a second priority if there is no need for manpower to carry out my research grants, I do have another list of topics that are very interesting but I've never had the time to do them (Dr.e2, engineering).

The priorities that the above engineering supervisor is referring to were not the same among all the engineering supervisors I interviewed. Dr.e1, for instance believed that funded projects were the ones he usually prioritised, and although he did not rule out the possibility that students select their own topics, he said he could not offer much help to such students.

Different students often took this whole issue of topic assignment differently. At one extreme, Saeed, an engineering student, had in fact asked his supervisor for a topic, and at the other extreme Armin, another engineering student, had not accepted to work on an assigned topic and had a number of negative feelings about it. There were also students who had accepted to work on what their supervisor had suggested because they wanted to do their courses and get their degrees:

> I feel I am working on something other people are interested in. So my main purpose for the time being is to get the certificate in order to set myself free from my supervisor, and then go and work on something I am interested in myself. I should say I don't want to be shallow and don't want the standard of

> my work to be lower than a certain level. But I think I will really be happy when I get my certificate, not because of the certificate itself, but because I will be free from being obliged to follow other people's ideas which I do not believe in (Shahram, engineering).

A more moderate form of the same type of feeling can be observed in the following quote by another engineering student:

> He [my supervisor] then gave me two topics and said I could work on one of them. And he said he would suggest one of them in particular. And I accepted. So now I have to accept whatever he says. I wasn't at a level to reject and say I want to work on something else or I am interested in something else … From then on I changed into a person who had to accept whatever my supervisor told me since I had no expertise or background in that area (Ali, engineering).

The fact that some students did not like to work on topics assigned by their supervisors often created tensions between them and their supervisors.

At this point, I would like to mention different types of relationships that might unfold between supervisors and students as a result of topic assignment. One possibility would be that a student asks his supervisor for topics. This was the case with Saeed (engineering) who had asked his supervisor to assign a topic to him upon the suggestion of senior students. He had done so to guarantee his success, because, as he put it, supervisors would not assume much responsibility on topics selected by students. Moreover, supervisors would not be able to offer much help to their students who had selected their own topics, as these might be outside the areas of their expertise. One could imagine that Saeed would be perfectly happy with the practice of topic assignment, and this, in fact, had not led to any tension between him and his supervisor.

Another case would be that students accept assigned topics by their supervisors because they think they have no other choice, or in other words they do it unwillingly. Shahram (engineering) was an instance of such a situation. He had agreed to work on the topic his supervisor wanted him to work on only because he thought he had no other option. He thought it would be the only way to get his degree. This might lead to a 'cold' relationship between a students and their supervisor, as was the case with Shahram (engineering).

The third possible case is one in which the engineering supervisor wants to assign a topic but the student does not accept it. This might often lead to lower degrees of support from the supervisor as they might not be an expert in the area the student has selected. In addition, the degree of tension created between a supervisor and their student might be such that they stop working together. Armin, one of the engineering students I interviewed was a case in hand, who had had to change his first supervisor for this reason. I believe that exploring these different possibilities and the outcomes they might have on the successful completion of PhDs would be good areas for further research.

As I will point out in *Chapter 7*, the assignment of topics seemed to be part of the prevalent 'Discourse' (Gee 1996) of the engineering sites I visited. In the social science/ humanities fields, however, it seemed that the students themselves were taken to be responsible for the choice of their research topics. Similar findings have been reported by Youngman (1994) and Deem *et al.* (2000) in separate studies: "In non-science fields, students usually choose their own topics and are rarely attached to a research team" (Deem *et al.*, p.151).

I pointed out above some types of relationships that might be created as a result of topic assignment in engineering, and the question that remains to be answered is: How does *non*-assignment of topics affect the relationship between students and their supervisors in the social science/humanities fields? This is another fertile area for further research.

6.6. Supervisors' Feedback on Students' Writings

The major types of writing that the engineering and the social science/humanities did were the upgrade report and the thesis itself. One of the important relations that existed in both these groups was the role the supervisor assumed as an expert in giving feedback to students' writing. In such a relationship, the supervisor was considered an expert who commented on the writing of the students. As I have already mentioned in *Chapter 2*, academic writing is often challenging to students, and supervisors often have an important role to play in helping students overcome this challenge, especially through providing feedback to students' writing (Lea and Street 1998; Caffarella *et al.* 2000, Johnson *et al* 2002).

In the present study, both the quality and the quantity of feedback received from supervisors were important to students. One of the engineering students, for instance, did not consider the feedback he received from his supervisor adequate. The supervisor only attended to formal features of writing without paying attention to the content of what his student wrote:

> His comments are solely on language. … he never gives any comments on the scientific aspects. He never says if something is correct, incorrect, or whatsoever. He says, " What are you trying to say? Explain that to me and I will write it for you in correct English". Or he corrects what you have written yourself (Saeed, engineering).

This issue of commenting solely on language and not on scientific aspects, was also present in the social sciences/humanities. Dariush, one of the social science/humanities students for example, had noticed that the comments his supervisor gave were "mostly on surface structure, grammar, wording, etc." Daruish's supervisor was obviously following a 'study skills' approach to academic writing (Lea and Street 1998).

Reza, another social science student, had recognised three types of comments he usually received from his supervisor. The first was on spelling:

> Because spelling in my text is quite different from other texts. Because it is full of Persian words that I wrote in Latin spelling. So only [my supervisor] or someone who is familiar with Persian … can correct these texts. So because he's quite familiar with Persian, he can correct my texts. And sometimes he suggests me [*sic.*] the correct way of writing Persian to English.

The second type of comment he received from his supervisor was on the organisation and structure of paragraphs. And the third type of comment he usually received from his supervisor was on the appropriate style he was expected to use in his writing:

> He says, "Ok this is grammatically correct, and you can use this, no problem. But in English there is this expression and in anthropology we usually use this and it's better" (Reza, social science/humanities).

On the basis of the data I gathered from the students and supervisors in this study, we can conclude that for the case under study, there were several layers of supervisor feedback available to students that can be roughly categorised as surface structure and organisation, i.e. 'visible comments'; and comments on content areas such as those relating to theoretical and analytical frameworks, i.e. more 'hidden' comments. The latter finding is consistent with that of Soter (1992) on the 'hidden agenda'

that often influences the judgement of tutors when scoring students' writings but hardly ever appear in the written feedback they provide to their students. Soter (1992) concluded "hidden agendas (criteria that govern our tastes as readers as distinct from our own tendency as evaluators of student-written texts) have been a source of confusion for students" (p.54). In other words, the feedback these students received was not of a quality to transfer to them the 'hidden agendas', which I presume to have a similar meaning to Discourses as I have used the term in this thesis.

Despite Caffarella's (2000) idea that feedback from supervisors is important in the overall understanding of research students of academic writing, some of the students in my study were not satisfied with the comments they received from their supervisors. Shahram, for instance, saw the comments he received from his supervisor as restrictive. This is very similar to Lea and Street's (1998) finding on the contested nature of academic writing mentioned earlier. In another study, Lillis (2000) studied the notion of academic essay as perceived by tutors and students. This study included 10 students from 'social groups previously excluded' from higher education in the UK. The main research focussed on essay questions as intended by tutors and as perceived by students. The students' written assignments together with the feedback from their tutors were analysed, and it was found that the tutors often took it for granted that the students had no difficulty understanding what they meant by concepts like 'explicitness in writing', while this was not often the case. In other words, what the supervisors meant by their comments was not always the same as what the students understood by them.

In the same way, there was a mismatch between Shahram's idea of what constituted 'good' academic writing, and that of his supervisor. Shahram believed his supervisor gave positive comments to those parts of his writings that matched her own interests, and reacted to Shahram's genuine thoughts negatively:

> I remember that my first report started with a few items I had thought out myself. And the following items included those within the framework of my supervisor's interests. But when she was reading those first items that were my own thoughts, she scornfully referred to them as if they were not valuable. But I believe that they were much more valuable than the other items (Shahram, engineering).

Shahram had also noticed in his later supervision meetings that his supervisor had not even read the reports he had sent her in advance. This was not particular to Shahram, however, as Farokh, another engineering student, had had a similar experience. When I asked him about the type of comments he received from his supervisor, he said:

> Nothing. Absolutely nothing. And I doubt if [he's] read them in the first place. At most [he] might have turned over the pages. There have been absolutely no corrections at technical or grammatical levels (Farokh, engineering).

Ivanic (1998) in a seminal work on academic writing and identity argued that "entering higher education as a mature student is associated with change, difficulty, crises of confidence, conflicts of identity, feelings of strangeness, the need to discover the rules of an unfamiliar world" (p. 7). Based on the empirical evidence in my own study, I would add *dissatisfaction with comments received on one's writing* in the case of PhD students to the list above.

Likewise, Farokh was not happy with this state of affairs. He expected his supervisor to read the reports he gave him, commenting on the way he had done his activities,

and telling him where his problems and weak points lay.

Bizhan, an engineering student in his final stages of his study had a similar idea and believed that feedback from supervisors was even more essential in the final stages of a PhD:

> The supervisor should support the student, should dedicate part of his time to the student, should guide him well, and the most important thing is that he read the students' reports and give feedback on them very quickly, especially at the end of your studies. There are some supervisors who are not like that and it takes them a long time to read your reports. This is very important (Bizhan, engineering).

Bizhan also believed that the quality of the feedback received from supervisors is vital to success. He believed that it is not enough to say, "this is bad writing, he should also say what you should do to fix that bad writing".

The supervisors I interviewed referred to their own role in giving feedback to the writings of their students. They considered giving feedback to their students as one of their responsibilities vis-à-vis students. Dr.e3 believed that one of the responsibilities of supervisors was to give feedback on their students' writing because they themselves had gone through writing a thesis and 'had the scars on their arms':

> … it's probably the role of the supervisor then, who's actually gone through it, who's got the scars on their arms to show they've written a thesis, that they can then try and get that across to students (Dr.e3, engineering).

Dr.e3 further believed that supervisors' comments could be crucial in helping students not to face "difficulty during the oral examination". However, he believed that under no circumstances should supervisors write for student:

> And it's my job as a supervisor to first of all make sure that they are writing a report that is of the correct standard. And I will also make sure that they are not making any errors…not errors…I mean that they are not writing in such a way that they are liable to… erm…lead themselves into difficulty during the oral examination. So that my job as the supervisor is to make sure that they are writing something of the appropriate standard (Dr.e3, engineering).

In contrast, a social science/humanities supervisor did not mind writing a little bit for her students, especially in the first stages of the PhD. I will come back to this shortly when I discuss the implications of supervisors' comments for the socialisation of PhD students into their discourse communities.

I would like to argue here that the main function of the feedback supervisors provided to their students on their writing was to help them acquire the prevalent 'Discourse' (Gee 1996, 1999) in their fields of study. As I have already argued, these 'Discourses' not only include appropriate ways of writing in different fields, but also appropriate methods of enquiry and appropriate relationships amongst the practitioners of the field among other things. Schwegler (1991), too, has shown how textual criticism can help novices learn the rhetorical conventions of their disciplines.

In *Chapter 2*, I referred to Geisler's distinction between the writing practices of expert and novice writers. According to Geisler (1994) the literacy practices of professionals and novices are erroneously taken to spread along a continuum in which novices strive to approach professionals. However:

> …these two sets of practices are substantially different in character. In particular, the literacy practices of the experts in the Academy are organised around the creation and transformation of academic knowledge; the literacy practices of novices, on the other hand, are organised around the getting and displaying of that knowledge (p. 81).

Therefore, one of the roles that supervisors might assume vis-à-vis their students is to help them move from the mere 'display of knowledge' to actually 'transforming knowledge'. Although Geisler based her argument on undergraduates, it seems to be relevant to my argument here as is evident in the following quote:

> [My supervisor] told me that I am a PhD student and I'm one step away from a PhD holder. So a PhD student should present their own ideas. [He added that] it's not enough to say [this reseacher] said so, or [that researcher] said so, etc. I should also say what I say. This is the same as critical thinking (Farhad, social science/humanities).

Therefore, supervisors' feedback to students' writings is in fact a scaffolding procedure to help students learn the 'nuts and bolts' of their field of study. I would also argue that this sort of feedback from supervisors could be explained in the light of the concept of Legitimate Peripheral Participation (LLP). In order to understand supervisors' feedback in terms of LPP, I would proceed with my argument on the basis of the two important features of this concept, namely 'legitimacy' and 'peripherality'. I should also add that this is not merely a repetition of what I have already written before, but my aim is to frame supervisor feedback as one of the ways through which Legitimate Peripheral Participation might take place.

As I explained in *Chapter 2* and earlier in the current chapter, 'legitimacy' means giving enough credibility to newcomers as potential members, and 'peripherality' means having newcomers engage in not very demanding tasks to help them become familiar with the 'Discourse' (Gee 1996) of their research community. This is exactly what the supervisors under study were doing. Dr.e3, for instance, had his new students engage in a 'peripheral' writing activity when he asked them to write on an issue, and through this he showed them many of the necessary components

of doing research in his field of study. What is important here is to point out that the supervisors did not always give feedback in the form of writing, but the feedback they provided to their students was sometimes oral or even demonstrative:

> And then I would then probably say over the next two weeks I'd like you to go and review a certain aspect of this topic, and then write a two-page report, and we'll sit down and talk about this when you're … in two weeks' time (Dr.e3, engineering).

He would then point out their problems:

> So for example an initial approach by the student will be to look at the textbook, which is what undergraduate students do, but obviously research students have got to, in essence, not look at textbooks, they have to look at research papers, things that have been published on in the last two to three years, so they won't be in textbooks. … And then also … teaching them … about modern [*2] tools like the science citation index as available on the internet, and the electronic version of the science citation index is [*3] probably about… er …two or three million times better that the paper version (Dr.e3, engineering).

One of the social science/humanities, supervisors also pointed out a scaffolding function for the feedback she provided to the writings of her students. In fact she believed that it was quite rational to write 'a little bit' for her students:

> … I think this all varies, I think there's probably rather more input [in writing] in the early stages. Again, I'd like to say that I think the supervisor must be….really….have a …..a(+2) history of good writing themselves, as well. So, it's, if you like, an induction into the appropriate kind of writing. So I see no problem in a little bit of rewriting of some texts… (Dr.h1, social science/ humanities).

In sum, the feedback the supervisors in this study provided to their students on their writing was a sort of scaffolding they adopted to initiate them into their communities of practice. The writings students did helped them 'participate in' and gave them 'legitimacy' as new members of their target communities of practice. The supervisors'

feedback allowed the students to familiarise themselves with the conventions and 'Discourses' (Gee 1996) of their discourse communities. And as students moved along their 'inbound trajectory' towards mastery of the Discourses of their communities of practice, they became more independent from their supervisors. However, the whole issue of feedback was contested among the supervisors and their students. Some students thought that the feedback their supervisors provided to them was not useful, while their supervisors had a different idea.

6.7. Manager-Like and Researcher-Type Supervisors

One of the engineering supervisors made a distinction between two types of supervisors: manager-like supervisors and researcher-type supervisors. This distinction is important in that it makes the relationship between students and these two different types of supervisors different.

According to Dr.e1, some supervisors in the engineering fields are like managers. They do not engage in research themselves. They only apply for funds to do research and then ask their students to do the studies. On the other hand, the researcher type supervisors take part in research themselves. According to Dr.e1, the manager-like supervisors do not provide enough support for their student. In such a context, the senior students take on most of the responsibilities that researcher-type supervisors usually assume, "and the student has to work with others in that group… to learn and find out how to start, what to do, how to initiate and all that" (Dr.e1, engineering).

The researcher-type supervisors take part in the funded projects themselves, and according to Dr.e1, that accounts for the higher quality of research studies conducted by research teams of researcher-type supervisors.

One of the points mentioned by Dr.e1 was that researcher type supervisors originate many of the ideas themselves and then ask students to elaborate on them. As he said, this is in contrast with what actually occurs in a manager-type supervisor context. Such supervisors cannot come up with brilliant ideas because they themselves do not engage in research, and students are required to come up with brilliant ideas. Dr.e1 believed that this is hardly possible and that is why many research studies are not often of high quality in such contexts.

Although I did not come across a context in which a manager-like supervisor was operative, it could be inferred from the above description that the researcher-like supervisors would have more contact with their students than manager-like supervisors. As a result of this, the manager-like supervisors in engineering seem to provide very little scaffolding even in the initial stages of research. In such a context, the senior students should assume the responsibility for scaffolding the newcomers into their communities of practice. In other words, manager-like supervisors will be to some extent detached from their students who are working in a community of practice. It seems that the issues concerning these two different contexts seem to be interesting areas for further research.

6.8. Conclusion

In this chapter I looked at the relationships between research students and their supervisors. My understanding of the data I have collected in this study suggests that PhD education has certain similarities with the concept of Legitimate Peripheral Participation (LPP) as discussed by Lave and Wenger (1991). The two main features of this social theory of learning, i.e., giving 'peripheral' roles to newcomers, and accepting them as 'legitimate' members of their target communities of practice were more or less realised in the 'easy' tasks supervisors assigned to their students. The goal of these 'easy' tasks was to make new research students 'familiar' with the 'Discourse' (Gee1996; 1999) of their target communities of practice. In this sense, I would argue that communities of practice of the kind I have been discussing so far could also be considered as 'discourse communities' (Swales 1990).

I would like to conclude by reiterating that the concept of LPP is very productive in helping us understand the nature of learning at the PhD level, but it is actually realised in different ways in different fields of study. In the engineering sites I studied, it was usually realised in the form of the assignment of easy tasks and simulations of previously done experiments, while in the social science/humanities sites, it was realised in the form of literature reviews, writing, and attending seminars.

CHAPTER SEVEN

TOPIC ASSIGNMENT

IN DISCOURSE COMMUNITIES

7.1. Introduction

As I have argued in the previous chapters, we can regard discourse communities as specific types of communities of practice in that the practice of writing is the central point for these communities (Beaufort 1997). In this chapter I will look at my ethnographic data of the engineering and social science/humanities students from a related perspective and categorise PhD students and their supervisors as academic communities of practice. In order to understand this way of looking at my data it is essential to frame the present discussion within the framework of studies in higher education. But before that I should mention that I would try to present this chapter in a way that will be descriptive of the grounded theory methodology I have used in my research. I should also clarify that I find the concept of 'academic communities of practice' much more fruitful and comprehensive than the concept of 'discourse communities', since it covers more than simply language. 'Discourse communities' is more restrictive in this regard. Nonetheless, to be consistent with the literature, I will be using these two terms interchangeably.

Different aspects of higher education have been the focus of many studies in recent years. These include studies of students writing in universities (Lea and Street 1998; Caffarella et al. 2000), writing practices of experienced science writers (Parkhurst, 1990), student-supervisor relationships (Acker *et al.*1994; Youngman 1994), and quality issues in the PhD (Phillips 1994), among others. One aspect of studies in

higher education is the academic socialisation of PhD students in general, and the choice of PhD topics, in particular. Previous studies (e.g., Shaw 1991; Jenkins 1993) have made reference to the ways in which topics are selected in different disciplines, but these have only been at a descriptive level. The present chapter aims to offer a conceptual framework for viewing some aspects of this issue and will specifically look at topic assignment in the social science/humanities and engineering from a more critical and analytical point of view.

In this chapter, first I will look at disciplines as academic and discourse communities (Kuhn 1996; Bizzell 1982), and then I will elaborate on the choice of PhD topics as an aspect of academic socialisation. I assume that socialisation into a discourse community is closely associated with acquiring the prevalent Discourse of that community (Gee 1996). I have given an account of the concept of discourse communities in *Chapter 2*, but I find it necessary to look at some basic issues again to prepare the ground for what follows in this chapter.

Casanave (1995) attributes the concept of 'communities' of scientists to Kuhn (1970, 1996), and his account of scientific paradigms and revolutions:

> A scientific community consists, …, of the practitioners of a scientific specialty. To an extent unparalleled in most other fields, they have undergone similar educations and professional initiations; in the process they have absorbed the same technical literature and drawn many of the same lessons from it. …the members of a scientific community see themselves and are seen by others as the men [sic] uniquely responsible for the pursuit of a set of shared goals, including the training of their successors (Kuhn 1996: 177).

Swales (1990) is one of the pioneers to operationalise the concept of discourse communities in educational contexts. He defines discourse communities as

"sociorhetorical networks that form in order to work towards sets of common goals." Swales (1990), however, does not give a clear definition of discourse. Nevertheless, as I have argued in *Chapter 2*, it can be inferred that his concept of discourse, although socially oriented, stems from a linguistic stance. This is particularly manifested in the distinction he makes between speech communities and discourse communities, as I have discussed in detail in *Chapter 2*.

Berkenkotter *et al.* (1991) likewise emphasised the distinction between speech and discourse communities and argued that:

> Academic or professional discourse communities are not necessarily located in specific physical settings, but rather their existence can be inferred from the discourse that members of a disciplinary subspecialty use to communicate with each other(p.191).

They add that the discourse used by a community defines that community and is the product of that community at the same time (p. 192).

Unlike many researchers and theoreticians who have emphasised linguistic features for defining discourse communities, Rafoth (1990) suggests that the concept of discourse community should be associated with much more than language issues. He then quotes Herzberg:

> A fully-developed theory of discourse communities should help to reveal what is at stake in a community that *isn't* language or only language: the cultural product of a community's work, the values and standards it supports, the roles and status of its members within the community and society at large (Herzberg, 1987: 3)

This is exactly what I want to emphasise in my understanding of the concept of discourse communities. For me Discourse is much more than merely linguistic and

rhetorical conventions. It is much broader in scope and deals with issues such as relationships between members of a community, specifically those between novices and old-timers, the ways novices are recruited and initiated into discourse communities, and even the conventions regarding legitimate topics and legitimate research methodologies (see also MacDonald 1987: 319). In fact academic discourse for me is very much similar to Gee's (1996) concept of D/Discourses:

> A *Discourse* is a socially acceptable association among ways of using language, other symbolic expressions, and 'artefacts', of thinking, feeling, believing, valuing, and acting that can be used to identify oneself as a member of a socially meaningful group or 'social network', or to signal (that one is playing) a socially meaningful 'role' (p.131).

However, as I have already argued in *Chapter 2*, Gee's definition of Discourse is too broad and I reproduce the definition I have presented for academic Discourses in *Chapter 2* below:

> Academic Discourses are disciplinary and institutional rules (whether overt or covert) regarding student-supervisor relationships, student-student relationships, types of documents used in a discipline, ways of displaying one's knowledge, and ways of writing.

Some scholars have pointed out epistemological issues concerning the concept of academic discourse communities (Clark 1992; Connor 1996). Chase (1988) believes that "discourse communities are organised around the production and legitimation of particular forms of knowledge and social practices at the expense of others, and are not ideologically innocent" (p.118), a point also mentioned by writers in the 'academic literacies' tradition (Lea and Street 1998).

My view of academic socialisation is concerned with the acquisition of the prevalent Discourse of a target discourse community; in the present case that of research

students in engineering, humanities and social sciences. This will include legitimate topics of enquiry, legitimate methods of enquiry, relationships among members of the community, and specifically knowing the role of topics and the way they are selected. I should once again emphasise that I am specifically focusing on PhD students as novice members who are initiated into their respective discourse communities.

I would argue that we can locate the practice of topic assignment in the broader framework of discourse communities, and we can frame academic socialisation as acquiring the norms and expectations that exist in a discourse community. These norms include not only issues regarding appropriate writing, but also norms regarding the relationships between students and supervisors and the choice of topics as well.

I also emphasize the contested nature of topic assignment in line with the academic literacies tradition. Lea and Street (1998), for instance, categorised students writing in universities into three models. The first model, the study skills model, regards writing as a set of skills that can be transferred from one setting to another. The second model, academic socialisation, presupposes a one-way process in which students are socialised into university. The third model, which they take as their own approach, however, is based on the academic literacies tradition, according to which the practice of academic writing is contested among tutors, students and institutions. I will regard topic assignment in discourse communities in a similar manner and try to capture perspectives of students and supervisors regarding this issue. I believe that looking at topic assignment within this framework will help us understand the contested nature of this issue better and see how this might address other issues in academic socialisation.

7.2. Topic Assignment

I define topic assignment as a condition in which supervisors assign topics to their students. In my research I came across engineering PhD students whose supervisors had assigned them specific topics to work on as their PhD projects. On the other hand, the humanities and social science students I interviewed were required to explore and come up with their own PhD topics. The engineering supervisors believed that one of their responsibilities was to give students their PhD topics for reasons that will be discussed later. The humanities and social science supervisors, on the other hand, believed that students themselves have the responsibility to select their own PhD topics.

This has been reported by other researchers, too. Shaw (1991) in his study of the writing practices of science research students found that "Many [science] supervisors had had some influence on the choice of topic" (p. 192). But the problem has remained at a descriptive level and very little has been done to problematise this situation. That is why this chapter will try to address this issue from a more analytic framework. I have discussed my methodology in detail in *Chapters 3* and *4*, and I suffice to reiterate that my research and findings were based on the procedures of grounded theory. This means that there was a dynamic process between my focus in research and findings. In other words, my focus in research was modified by the feedback I received from my findings. In the following section I will look at the practice of topic assignment from the perspective of supervisors under my study.

7.2.1. Supervisors' Perspective on Topic Assignment

One way of looking at differences in topic assignment in the humanities/ social sciences and engineering would be to hypothesise that these differences result from different epistemological stances between these fields, namely what is knowledge, the legitimate ways of knowledge production, and where the position of a PhD course is with respect to the production of knowledge. In fact it seemed that choosing PhD topics was not part of the process of doing a PhD in engineering, whereas it was part of doing a PhD in the social sciences/humanities sites under study. One of the engineering supervisors, for instance, told me the following about the practice of topic assignment:

> In science and engineering, students don't know what to work on anyway. So you have to tell them (Dr.e1, engineering).

However, this seemed not to be the case for the humanities/ social science supervisors. They believed that doing a PhD entails choosing a topic. This is evident in the following quote from one of the humanities/social sciences supervisors:

> Well, for me, [doing a PhD] is choosing a particular subject, a particular interest, and wanting to take that subject beyond its current boundaries of existing knowledge, and to take it into new areas, however modest that new area might be (Dr.h1, social science/humanities).

Engineering supervisors often conceived of topic assignment as a specific strategy to initiate students into their disciplines. They started by assigning small tasks to their students, the answer to which they already knew. As I mentioned in *Chapter 6*, this was referred to as a machiavellian strategy by one of the engineering supervisors.

There was a consensus among three of the engineering supervisors in adhering to the above strategy. These small tasks were meant to motivate students and to evaluate them in terms of their capabilities in doing research. After this initial assignment of small tasks, engineering supervisors assigned their students the 'real topics' of their PhDs:

> ….and when they get on board, I give them more advanced … and their real topic of research (Dr.e1, engineering).

However, another engineering supervisor believed that engineering supervisors only "pretend that they have an epistemology", and "engineering supervisors are business-like" (Dr.e2, engineering). I interpret this as itself grounded in epistemological presuppositions, one being that knowledge is to be collected through practice rather being constructed through studying, as in the social sciences. This brings me to the next factor in topic assignment, namely funding.

7.2.1.1. Funding

It seemed that funded projects had an important impact on the practice of topic assignment in the engineering discourse communities under study. In addition, I believe that the practice of topic assignment, although to some extent regulated by different epistemologies in different disciplines, was modified in non-trivial ways by funded projects referred to university departments from industry and other funding bodies outside of the university. In other words, there were both ideological and material considerations that affected the 'whether' and 'how' of topic assignment.

One of the main findings of this study was an observation of a sharp difference between the number of funded projects in the humanities/social sciences and the

engineering disciplines. None of the humanities/ social science students was involved in a funded project, while many of the engineering students were. In fact at least two out of the four engineering supervisors whom I interviewed had their PhD students work on these projects, because these projects required teamwork to be conducted, as one engineering supervisor said:

> But many times … they [students] come to me, because I have money not because they are interested in my topic. So money talks actually, not my research background or interest, or even my knowledge, etc (Dr.e1, engineering).

Another engineering supervisor assigned PhD topics to his students because he needed 'manpower' to do his 'current funded projects' (Dr.e2, engineering).

Apart from funded projects that the engineering supervisors assigned to their students, they also assigned topics because, as they put it, they had a lot of unanswered questions they needed answering.

The engineering supervisors, however, did not rule out the possibility of students choosing their own topics, but they believed that this was very rare in engineering and in addition, the supervisor would not be able to offer much help to such students who had chosen their own topics. As a result students would be left alone to work through their projects. Shaw (1991), too, reported that science students who had chosen their own topics felt isolated because "they had little to do with departmental projects" (p. 193).

The two humanities/social science supervisors interviewed did not assign topics whatsoever. This could be explicable in terms of the different epistemologies

prevalent in the humanities/social sciences according to which, I argue, choosing topics is part of doing the PhD. This has been reported to be creating some difficulties for social science students by Burgess (1994). In addition these supervisors did not have access to funding, or if they did, their students were often not involved in those projects.

In contrast, the fourth engineering supervisor I interviewed was very much in the same circumstances as the two humanities/social science supervisors. Similar to the humanities/ social science supervisors, she had no access to funds from industry. I will talk about reasons for this lack of access to funding later, but what I would like to emphasize here is that she still assigned topics to her PhD students, although she only assigned broad areas of enquiry rather than specific topics. In other words, her students were semi assigned whereas the students of other engineering supervisors were categorised as assigned. However, she thought it would be unfair to assign topics at least for the first two or three months of starting the PhD:

> you can't sort of push students, it's not fair for the first maybe two or three months. Let them…give them some suggestions and let them go and work through these suggestions and see what they want to do within these framework, as it were (Dr.e4, engineering).

In a later enquiry, this engineering supervisor explained the reason why she assigned topics to her PhD students:

> Initially students must be given a bit of freedom to pursue their own line of inquiry, within some guidelines of course. However, as the supervisor has to be responsible for the student's progress, it can't stray too far from the supervisor's expertise. Also students must start to fix their ideas after a few months, else they won't finish (Dr.e4, engineering).

The engineering supervisors I interviewed, whether funded or not, viewed topic assignment as one of the strategies they would use to 'push' students forward, and help them with their studies. As we will see later, this same practice was viewed by some engineering students as 'pressures' imposed upon them.

7.2.2. Students' Perspectives on Topic Assignment

As was mentioned before, seven out of the eight engineering students were assigned topics by their supervisors, while none of the humanities/social science students were. As I have argued, one reason for this could be different epistemologies and ideologies concerning what constitutes a PhD. It could be argued that humanities/social science PhD students are given more freedom, and at the same time more responsibility to choose their own topics. In other words, humanities/social science students are not regarded as complete novices who are not able to determine what constitutes a legitimate topic in their field of study. In contrast, engineering PhD students are considered as novices who are not at a level to make this judgement. One of the engineering students, for instance, believed that his supervisor knew what topics and areas were "fashionable" (Bizhan, engineering). That was one of reasons for which he had accepted a topic suggested by his supervisor. Berkenkotter and Huckin (1995) in their sociocognitive approach to genre refer to a concept similar to Bizhan's 'fashionable topics' and write that professional academics should know 'what winds are blowing' in their fields:

> Our thesis is that genres are inherently dynamic rhetorical structures that can be manipulated according to the conditions of use, and that genre knowledge is therefore best conceptualized as a form of situated cognition embedded in disciplinary activities. For writers to make things happen (i.e., to publish, to exert an influence on the field, to be cited), they must know how to strategically utilize their understanding of genre. Their work must always appear to be on the cutting edge. This means that they must understand the directions in which a

> field is developing at any given time and possess the rhetorical savvy necessary for positioning their work within it. An academic writer needs to possess a highly developed sense of timing: At this moment what are the compelling issues, questions and problems with which knowledgeable peers are concerned? What is the history of these issues in the field? (p. 3).

If we agree that PhD topics should be at the cutting edge of fields of study, then the practice of topic assignment in engineering would seem more realistic.

It seemed that most engineering students were happy having been assigned topics for certain reasons. In fact some engineering students themselves had asked their supervisors for topics. One of the engineering students under study, for instance, mentioned 'a guarantee for success' as his reason for asking to be assigned a topic. I mentioned in *Chapter 6*, he had been advised by senior students in his department to do so, because, as he put it, supervisors would not assume any responsibility if something goes wrong for topics chosen by students themselves. In addition, if topics chosen by assigned students were not among the specialties of the supervisors, they would not be able to give as much support as they would to assigned students (Saeed, engineering) . It is interesting to note that most engineering supervisors and students mentioned these ideas.

Another factor noted above that might influence engineering students to be willing to do assigned topics is the funded nature of these projects. Although this was not brought up directly in the interviews with the students, one of the engineering supervisors clearly pointed out that funded projects attracted a lot of students to his research group (Dr.e1, engineering).

There was a relative consensus among the engineering students and their supervisors about the sources from which PhD topics might be selected. One of these sources, as discussed in the previous paragraphs, was the funded projects of supervisors. A second source was the unanswered questions of supervisors. As most of the engineering students mentioned, supervisors usually have a set of unanswered questions that they have not had the time to answer. It was also very interesting that the engineering supervisors often mentioned this same source for PhD topics as well.

The students and supervisors often interpreted the same practice in different ways. In other words, the different practices conducted in the discourse communities under study were often contested among different members of these communities. For instance, the practice of 'pushing' students, was interpreted in a positive way by supervisors as they saw it as a sort of help they could offer students to progress. Some students, however, regarded this as pressure being imposed upon them by their supervisors.

7.2.3. Boundary Cases

Following a similar line of argument to that of Wenger's (1998, pp.103-108) on 'boundary objects' and 'brokering', I refer to boundary cases in my study as those that were at the borderline of categories in this study. For Wenger (1998), 'boundary objects' are objects common to overlapping communities of practice, while 'brokering' refers to people who "can introduce elements of one practice into another" (p.107). Boundary cases in the present study are taken to be the people who showed features of different communities of practice, though these different communities did not necessarily form a "multimembership nexus" (Wenger 1998, p. 105). In other

words, people doing 'brokering' in Wenger's terms, often help interconnect different, but related, communities of practice. In the present study, no 'brokering' in that sense was observed, but, more specifically, some of the engineering students and supervisors showed features that seemed to be more closely associated with the social science/humanities fields rather than with their own. It is this latter sense of 'boundaryness' I am using in this section.

As indicated earlier, it seems that assignment of topics is the norm in the engineering fields, whereas non-assignment is the norm in the humanities/social sciences. Therefore, the issue of assignment of topics is a borderline between the humanities/social sciences and engineering. Whenever an engineering student selects their own topic for whatever reason, this crosses the borderline and challenges what I identified as the 'norm', and we may say we are dealing with a borderline case, as there appears to be a slippage between the two areas. Likewise, having access and involving PhD students in funded projects seems to be the norm for engineering supervisors. So I regard an engineering supervisor who does not have access to and/or involve their PhD students in funded projects as a boundary case.

Borderline cases are important because they mark the distinctions that exist between and among defining categories of disciplines. In this section of the chapter, I will discuss two engineering students and one engineering supervisor, as they were located on the borderlines of prevalent Discourses in their discourse communities.

As I have already shown, the practice of assigning topics seems to be a common feature of the engineering disciplines. In the humanities/social sciences I did not find

any student who had been assigned topics by their supervisor. This could be partly explicable in terms of funding. It seems that the tradition of assigning funded topics to PhD students is not customary in the humanities/social sciences. One hypothesis, therefore, would be that if a specific engineering supervisor does not have access to funding, they would not assign topics to their students. However, I found an engineering supervisor who did not believe in funded projects, yet she still assigned topics. She thought that funded projects restricted PhD students, and therefore, they would not develop in the way they should. I will refer to this engineering supervisor as Dr.e4, and elaborate on her in more depth. This is because I regard Dr.e4 as a boundary case and I believe that boundary cases are illuminating in providing us with more vivid pictures of models we are trying to make.

7.2.3.1. Dr.e4 as an Engineering Boundary Case

The first boundary case I am going to examine is Dr.e4, an engineering supervisor in one of the universities in the UK. Her speciality was in computing and she had a number of PhD students.

Dr.e4 mentioned two purposes for doing a PhD prevalent in computing, a 'mercenary', and a 'utopian' one. She believed that from the point of view of students, it is mostly the mercenary purpose that is considered, although they may start off on a utopian one. Dr.e4 herself, however, believed in a utopian view of doing a PhD, and she stated that some people do it because they want to pursue something further. This is quite similar to what one of the humanities/social science supervisors expressed regarding doing a PhD and quite different from the previous three engineering supervisors. As I will explain shortly, this seems to be an important

finding and probably explicable once the issue of funding in computing in UK universities is explained.

As Dr.e4 said, there is very little liaison between computing departments and industries in the UK compared with the situation one might find in the US or in some European countries. Industrial partners in the UK are usually reluctant to have their projects carried out by computing departments for two main reasons. The first reason is that PhDs often take three to four years to complete, and given the speed with which the applied side of the computer science is progressing, it is not economical to have universities carry out practical research studies:

> … industries don't seem very eager to give money for PhD students. …And … if things are to be very practical, …they don't want a student to do it (Dr.e4, engineering).

Another reason, according to Dr.e4, is that research projects are often secret for business reasons and they do not want PhD students to go around and talk about them in public or give seminars on them. According to Dr.e4, these factors have made it almost impossible to do practical (applied) research in computing in universities in the UK. As a result, most PhD students in computing study theoretical topics.

Compared with earlier findings of this study in engineering and the humanities/social science sites, it seems that there is a relationship between funding and doing PhDs. In the case of Dr.h1, a humanities supervisor, I explained that she was more of an idealist about the purpose of doing a PhD. She believed that doing a PhD was "pushing the boundaries of science further". Dr.e4 had exactly the same idea. I can argue that this is probably because neither of them had much or any access to funding.

On the other hand, all the other engineering supervisors (Dr.e1, Dr.e2, and Dr.e3) had funded projects running, and had more or less divided their projects into manageable units to be carried out by their PhD students. Their view on doing a PhD was more practical and applied than utopian, as we can see from the following PhD purposes mentioned by them:

Dr.e1: doing a PhD is for teaching better;

Doing a PhD is for doing better research in one of the social services;

Dr.e2: pursuing an academic career;

Dr.e3: teaching at undergraduate level.

In Dr.e4's case, the lack of funds from industry was probably connected with her pursuit of theoretical issues. She, just like Dr.h1 in humanities, believed that doing a PhD is trying to pursue an issue further. In addition, Dr.e4 believed that funded research is somehow questionable if undertaken for the purpose of doing a PhD:

> So I think people on the more practical computing science find that easier. And you also have to have a good liaison with the industrial partner, so that the student is allowed some freedom. The student has got to learn to develop, that's the whole purpose of PhD, but it's no good if you dictate everything to them (Dr.e4).

The next point I would like to mention is that Dr.e4 did not seem to be too rigid with research topics selected by students so long as they fell within the broad framework of her interests. She often offered her PhD students suggestions for the first two or three months and let them explore and decide what they wanted to do within the framework she had pointed out to them. Selecting topics, however, seemed to be a source of tension between her and her students in the initial stages:

> …initially there is a slight tension because the student comes knowing what they want to do … the supervisor knows what they want the student to do, and it's not always exactly the same. And you sort of have to compromise both sides a little bit.

7.2.3.2. Armin and Shahram as Engineering Boundary Cases

Armin was an engineering student studying in a UK university. I had categorised him as a non-assigned engineering student in my pilot study. He had come from Iran with a definite idea of what he was going to do. Upon arrival, he had found out that his supervisor wanted to divert him to his own areas of interest, which he had rejected. This had made him to change his supervisor. This new supervisor, jointly with a second supervisor, had accepted to supervise him on what he wanted. He had worked on his project for one and a half years, doing experiments and coming up with good results. It was at this point that he had decided to take a break and go back to Iran for a holiday upon the suggestion of his supervisor. After coming back from Iran, he had found out that his supervisor, being diagnosed with cancer, had undergone an operation, and as a result had been paralysed. This was a very difficult situation, but what made it even harder for Armin was that he had to find a new supervisor, as his supervisor was not able to work anymore. After going through a lot of difficulty, the graduate tutor of the school had accepted to supervise him. He had been very helpful in providing him with the facilities he required for his experiments, but he wasn't able to offer him much technical advice, as Armin's topic was not among his areas of interest. In addition, Armin was not able to communicate with other members of his department because, I assume, he was working on a topic he had chosen himself. This chosen topic was not among the topics adhered to in his department. To cut a long story short, he had not finished his PhD after seven years.

As I have already mentioned, Armin seemed to be a special engineering case in many ways. One of these characteristics was that Armin had rejected the idea of changing the topic he had proposed in his proposal, and this had created some problems for him.

Another interesting and up to a point strange case is that of Shahram, another engineering student. Neither Shahram nor his supervisor, Dr.e4, believed in doing research for funding. Dr.e4, as we saw above, believed that funding restricted students and did not allow them to develop. Nonetheless, she had assigned a framework for Shahram and restricted him in his choice of topics. This created some degree of tension at the beginning between her and her student, Shahram, but at the end Shahram had decided to oblige by adhering to the framework assigned to him. Shahram, too, did not believe in doing a PhD on funded projects. He had only agreed to work within the frameworks set by his supervisor to get his PhD, and pursue his own line of research later.

Although Dr.e4 seemed to be thinking very much like Dr.h1—the humanities supervisor who had an idealist view on doing a PhD—she tended to assign topics, however general, to her students. I hypothesised that Dr.e4 assigned topics because topic assignment is part of the prevalent ideology in engineering, as reflected in Dr.e1's comment, one of the engineering supervisors who believed that novice students do not know how to do research and supervisors have to assign topics in any case. Or in other words, as I have argued earlier, it seems that topic selection does not seem to be part of doing a PhD in engineering. My intuition was supported when I contacted her again later and asked her to explain why she assigned topics to her PhD

students. As we saw above, she did so because she thought it was the responsibility of the supervisor to make sure that the student is working on a topic within the expertise of the supervisor and does not waste their time.

7.3. Conclusion

In this chapter I have tried to frame the idea of topic assignment in the broader framework of academic socialisation into discourse communities. I favoured a broader definition of discourse very much like Gee's (1996) conception of a big D Discourse, and argued that this has to be acquired by novices if they are to socialise into their discourse communities. The big D Discourse in discourse communities includes not only the linguistic issues but also all different types of epistemological as well as practical issues adhered to and practiced in discourse communities.

I particularly problematized one aspect of academic socialisation of PhD students and referred to it as topic assignment. I defined this as the way topics are agreed upon and selected at PhD level. I found that, although I suspected this practice to be mainly influenced by prevalent epistemologies found in engineering and the social sciences/humanities, it is actually modified by material conditions such as funds available to do research in engineering. In fact funding is so important that it is often the main determining factor wherever it is available.

I also categorised assignment and funding as norms in engineering disciplines, and non-assignment and not involving PhD student in funded research as norms in the humanities/social science. Then I identified two engineering boundary students and an engineering boundary supervisor and argued that these were located at the borderlines

of defining categories I have identified for the humanities/social science and engineering.

If we agree with Berkenkotter and Huckin (1995, p.3) that scholarly activity involves knowing the 'cutting edge' of one's field, the selection of PhD topics can be regarded as one of the most important and delicate issues in doing a PhD. This is because the PhD topic should be at the 'cutting edge' of the profession. Having said that and considering most 1st year PhD students as novices who are yet to know the cutting edge of their fields of study, it seems that the engineering supervisors under study were being more realistic with regard to the way PhD topics should be selected. And last but not least, I believe that understanding topic assignment as an important practice in discourse communities helps us understand discourse communities better and will make many of the prevalent practices in discourse communities problematic, and thus worthy of being rethought.

CHAPTER EIGHT

A REVISED MODEL FOR DIMENSIONS OF PRACTICE IN WENGER'S THEORY OF COMMUNITIES OF PRACTICE[1]

8.1. Introduction

In this chapter, I will pull together different ideas discussed in this thesis and try to present a coherent picture of my findings regarding the academic socialisation of PhD students in the fields of engineering and the social sciences/humanities. I will first look at the issue within the framework of Wenger's (1998) theory of Communities of Practice, and then discuss the extent to which the concept of Legitimate Peripheral Participation (LPP) can be extended to the relationships between research students and their supervisors. I will argue that the research students and their supervisors in this study constituted special types of communities of practice, but the features these showed were to some extent different from the 'claims processors' Wenger studied. Drawing upon Wenger (1998), I will differentiate between two types of Discourses (Gee1996) in such a context: procedural and reificatory Discourses.

8.2. Is It Useful to Consider PhD Students and Their Supervisors as Communities of Practice?

In order to answer the questions raised throughout this thesis, I shall recapitulate the main features of communities of practice as characterised by Wenger (1998) and explore the extent to which PhD students and their supervisors can be taken as examples of these communities.

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[1] This chapter together with chapter 5 formed the basis of a paper I presented at BAAL Annual Conference, Cardiff, September 2002.

Wenger (1998) very clearly points out that his main endeavour is to look at learning from a social perspective. In his social theory of learning, the main factor at work in learning is 'negotiation of meaning' taking place among members of a 'community of practice', which is his term to describe a social unit consisting of people who have gathered to achieve a 'shared enterprise':

> I will use the concept of negotiation of meaning very generally to characterise the process by which we experience the world and our engagement in it as meaningful (p. 53).

The negotiation of meaning, as Wenger (1998) puts it, takes place as the result of the interaction of two basic processes: 'participation' and 'reification':

> … I will use the term participation to describe the social experience of living in the world in terms of membership in social communities and active involvement in social enterprises. Participation in this sense is both personal and social. It is a complex process that combines doing, talking, thinking, feeling, and belonging. It involves our whole person, including our bodies, minds, emotions, and social relations (pp. 55-56).

Wenger (1998) further describes reification as follows:

> I will use the concept of reification very generally to refer to the process of giving form to our experiences by producing objects that congeal this experience into "thingness". In so doing we create points of focus around which the negotiation of meaning becomes organized (p.58).

While participation is something to do with relations among people, reification is something to do with relations between people and the world:

> Whereas in participation we recognize ourselves in each other, in reification we project ourselves onto the world … (p. 58).

Wenger (1998) further asserts that negotiation of meaning takes place as the result of the simultaneous interaction of participation and reification. I have drawn a diagram

(Figure 8.1) based on Wenger's discussion on the relationship among reification, participation, and negotiation of meaning that clarifies the issue to some degree. As a concrete example, if we take research students as a community of practice, they participate in meaningful interactions with each other, and at the same time they work with reified materials that are the heritage of their communities, such as artefacts and even abstract concepts, such as 'cognition', 'behaviour', and 'simulation', they have become accustomed to as the result of their constant use. Research students, for example, can be argued to be negotiating meaning in these two processes of participation and reification. They participate in certain activities, and they also use certain artefacts and concepts to do research. Moreover, Wenger implies that research students and their supervisors form communities of practice: "Today, doctoral students have professors who give them entry into academic communities" (1998, p. 101). As I will argue later, I agree with Wenger in regarding research students as communities of practice, but what I will point out later in this chapter is that research students as communities of practice show features that are not fully accounted for by the theory presented by Wenger.

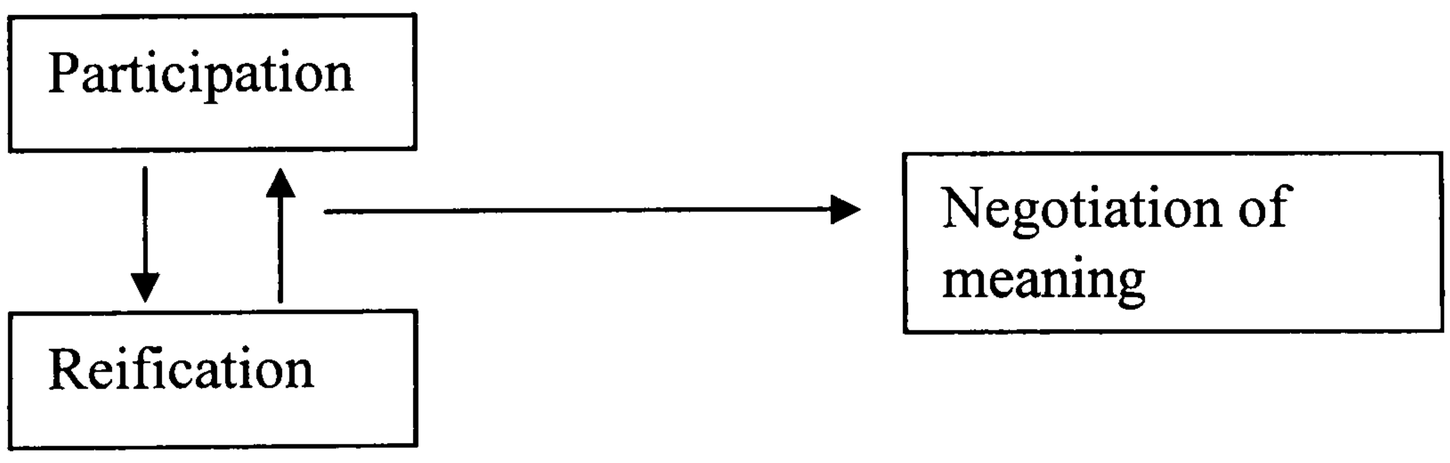

FIGURE 8.1: Negotiation of meaning as the result of participation and reification

The concept of participation may present a very positive picture about people in communities of practice working together, taking part in activities and mutually

engaging in shared activities. Wenger (1998), however, points out that he uses the term 'participation' in a special sense:

> … participation as I will use the term is not tantamount to collaboration. It can involve all kinds of relations, conflictual as well as harmonious, intimate as well as political, competitive as well as cooperative (p.56).

The same idea is reiterated elsewhere:

> Peace, happiness, and harmony are … not necessary properties of a community of practice. Certainly there are plenty of disagreements, tensions, and conflicts among [members of a community of practice] (p. 77).

Although stated in this broad framework, Wenger mostly takes 'participation' to mean cooperation rather than a mixture of both 'competition and cooperation' in 'communities of practice'. This will become clear if we look at the three features that Wenger (1998) mentions as the sources of coherence of communities of practice: mutual engagement, joint enterprise, and shared repertoire. I will presently elaborate on each of these features, but first I would like to refer to Wenger's idea on the relation between mutual engagement and learning in practice.

'Mutual engagement' is defined by Wenger (1998) as activities that members of a community share to conduct their practice. It is also the most important factor contributing to learning, and to the socialisation of newcomers, as discussed in this theory. In fact, Wenger (1998) is quite clear in this regard when he points out his social perspective on learning:

> *Learning is a matter of engagement:* it depends on opportunities to contribute actively to the practices of communities that we value and that value us, to integrate their enterprises into our understanding of the world, and to make creative use of their respective repertoires… (p. 227).

In another part of his book on communities of practice Wenger (1998) states that "supporting engagement is supporting the formation of communities of practice" (p. 237). He then suggests that promoting "joint tasks: things to do together; availability for help" (p. 237) will help support communities of practice. This shows that 'participation' as used by Wenger is taken to mean 'collaboration', although he has tried to refrain from this sense of the word.

Another point I would like to clarify is the relation between 'negotiation of meaning' and the three dimensions of practice outlined above. As I have already pointed out, 'practice' is the point of departure for Wenger (1998), and "negotiation of meaning … is the level of discourse at which the concept of practice should be understood" (p. 72). In other words, members of a community of practice engage in 'meaningful practices', and in order to do this they 'negotiate meaning', and they negotiate meaning through participation and reification. The three dimensions of practice are in fact the three features by means of which the concepts of 'community' and 'practice' are related. Not every community is a community of practice, and not every practice leads to a community of practice. A community of practice is one with the three dimensions of practice as its features, in which members negotiate meaning through participation and reification.

At this point, I would like to answer the question raised in the title of this section. The answer, I would argue, is that research students and their supervisors I have studied can be considered as located in different communities of practice. However, the model presented by Wenger (1998) does not seem to capture all aspects of the communities of practice I studied: research students constitute special types of

communities of practice whose features are to some extent different from those of 'insurance claims processors' as studied by Wenger. This claim will be taken up in the following sections.

8.3. Three Dimensions of Practice as Sources of Coherence of a Community of Practice

As I mentioned earlier, Wenger discusses communities of practice from different perspectives. The first of these perspectives looks at communities of practice as locations in which negotiation of meaning takes place. The other aspect of communities of practice is to look at them primarily as particular social units with certain features. These features will be discussed in this section, and I will try to map the findings of my study onto these categories and see the extent to which my findings are interpretable in the context of the frameworks outlined by Wenger and also where these frameworks fall short of accounting for my findings. This will be followed by a modification of the theory of communities of practice as presented by Wenger (1998). I shall also point out that my main framework is still a constructivist version of grounded methodology discussed in some length in *Chapters 3* and *4*. This means that I will not attempt to force my data into readymade theoretical frameworks. Rather, I will explore the extent to which my data are congruent with, or push us to modify the relevant theoretical frameworks.

As I discussed in detail in *Chapter 2*, Wenger outlines three features of communities of practice that are responsible for the coherence of such communities. The first of these features, mutual engagement is regarded as one major aspect of any community of practice. It includes features such as *doing things together,* and *relationships*:

> Membership in a community of practice is therefore a matter of mutual engagement. That is what defines the community. A community of practice is not just an aggregate of people defined by some characteristic. The term is not a synonym for group, team, or network (pp. 73-74).

Wenger (1998) elsewhere categorises mutual engagement as necessary for a community of practice:

> Whatever it takes to make mutual engagement possible is an essential component of any practice (p. 74).

Another feature of the coherence of a community of practice is a *joint enterprise*, in the sense that members of a community of practice come together to achieve similar goals, although most of these goals are prescribed institutionally. And the third feature is a *shared repertoire*, meaning that communities of practice have accumulated over time shared knowledge, artefacts, tools and concepts.

I would like to argue that the model presented by Wenger (1998) suffers from two main types of deficiencies. The first comes from the way the three main categories are put together. And the second is the fact that this model cannot explain all aspects of at least some communities of practice. In other words, borrowing terms from the field of language testing, the theory seems to be suffering from lack of both internal and external validities, internal validity being the relationships of different aspects of this theory in relation to one another, and external validity being the extent to which this theory can be generalised to other contexts. I will deal with these in the following section. However, I should add that it is at times difficult to distinguish these two types of validity. That is why the reader might find some overlap between these two concepts in my discussion below.

8.4. The Internal Validity of the Model of Dimensions of Practice in Communities of Practice

As I mentioned in the previous section, the relationship between the parts of the theory of communities of practice, i.e., 'mutual engagement', 'shared repertoire', and 'joint enterprise' do not seem to be explicated clearly in the model presented by Wenger (1998):

As is clear from FIGURE 8.2 below, each of the cohering features of communities of practice is connected with a solid line to the other two without showing how these might be different in nature from other features. However, these three features do not seem to be at the same level, although the model implies they are. In fact, joint enterprise seems to be at a higher level than the other two features, i.e., mutual engagement and shared repertoire. We have to assume that all members of a community of practice have set for themselves some similar goals to achieve. Indeed the very fact that they have come together in the same community of practice is telling and points to the fact that they have certain things in common. Therefore, joint enterprise seems to be the overarching feature that brings people together in a community of practice to achieve certain goals. This is not to say that members of a community of practice all have the same goal, but that the range of the goals they are aiming at is more or less similar. However, we will see that this might not be so straightforward when I bring in some empirical evidence later in this chapter in the context of the external validity of this theory.

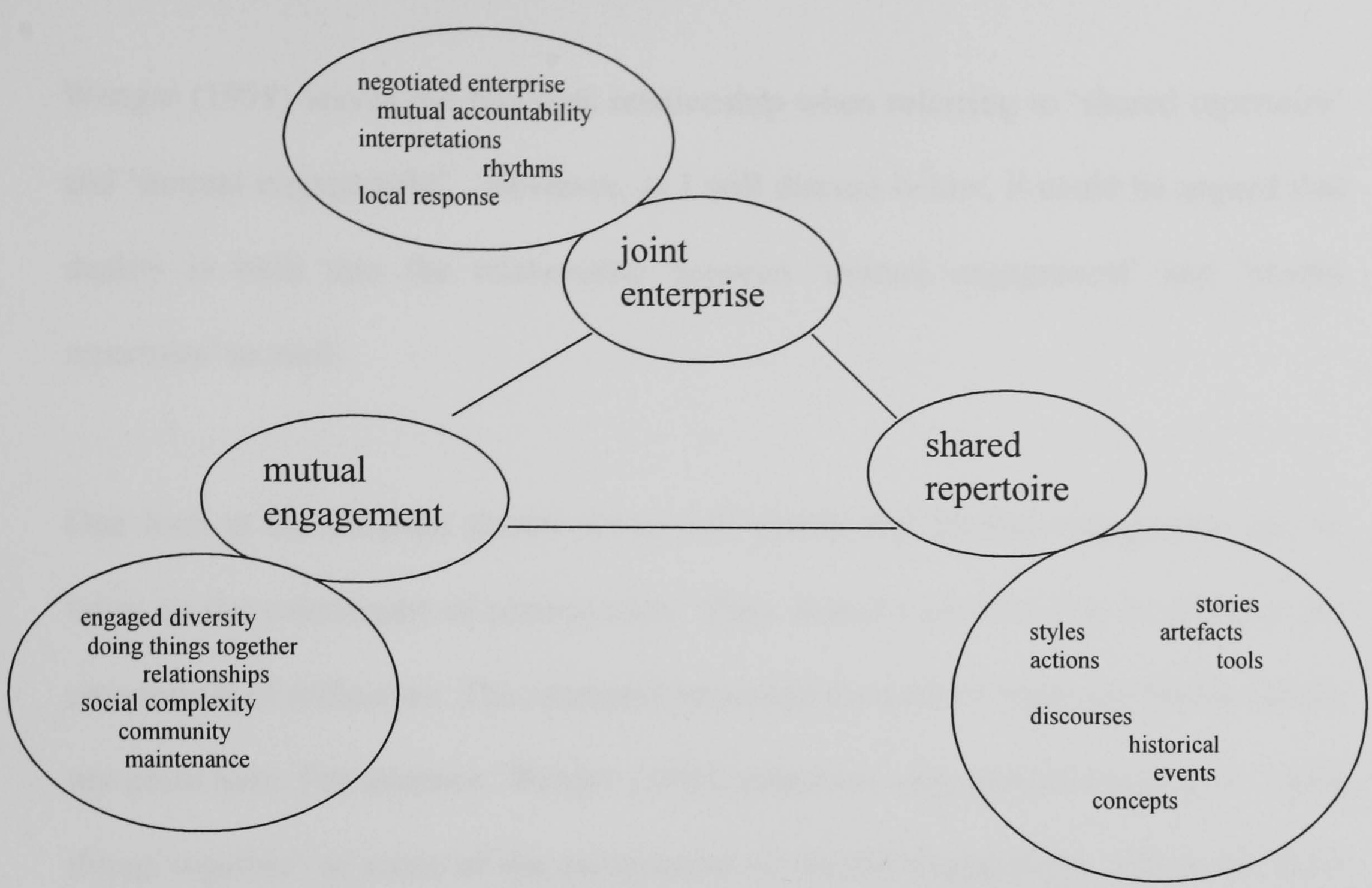

FIGURE 8.2: Dimensions of practice as the property of a community (Wenger 1998, p. 73)

The other two features of a community of practice that are responsible for the coherence of a community of practice are mutual engagement and a shared repertoire. These two features seem to map onto the two ways by which members of a community of practice negotiate meaning in order to learn, namely 'participation' and 'reification' respectively, although Wenger (1998) does not refer to them in this way.

Earlier in his account of 'participation' and 'reification', Wenger (1998) clearly defines the relationship between these two as a 'duality' and not as a 'classificatory scheme':

> In a duality, what is of interest is understanding the interplay, not classifying. The duality of participation and reification is not a classificatory scheme. It does not classify meanings, thoughts, knowledge, or learning as tacit or explicit, formal or informal, conscious or unconscious, individual or collective. Rather, it provides a framework to analyze the various ways in which they are always both at once (p. 68).

Wenger (1998) leaves out this dual relationship when referring to 'shared repertoire' and 'mutual engagement'. However, as I will discuss below, it could be argued that duality is built into the relationship between 'mutual engagement' and 'shared repertoire' as well.

One look at the diagram shown above will clarify that mutual engagement can be taken as the counterpart of participation, while shared repertoire can be taken as the counterpart of reification. The examples presented for each of these can further clarify my point here. For instance, Wenger (1998) mentions 'engaged diversity' and 'doing things together' as some of the components of mutual engagement, which are more congruent with 'participation'. This is because they all somehow point to some notion of participating in actual activities. On the other hand, the components of 'shared repertoire' are more or less reified representations, such as 'styles', 'stories', artefacts', 'discourses', 'historical events', and 'concepts'.

Although most components of 'shared repertoire' represent reified representations, *actions*, I assume, brings to mind a process, and therefore it should have been placed in the 'mutual engagement' of this model. This I believe is another factor that endangers the internal validity of the theory of community of practice and needs to be modified.

In sum, it seems that the theory of community of practice as presented by Wenger (1998) suffers from at least three factors concerning its internal validity. The first is that the three features of the coherence of a community of practice do not seem to be at the same level, while these are intended to be taken at the same level in the theory

presented by Wenger (1998). The second factor is that 'mutual engagement' and 'shared repertoire' seem to enjoy a dual relationship, or as two faces of the same coin while this is not taken into account in this theory. The third factor is regarding the position of 'actions' within the components of a 'shared repertoire', since it is not clear whether 'actions' is taken to be a reified concept or a process. If it is taken as a reified concept, it should have been pointed out, and if it was meant to be referring to actions as processes, it should not have been placed within 'shared repertoire' but within 'mutual engagement'. As I will show in the next section on the external validity of this model, some of the subcomponents of these three dimensions of practice are also contradictory. These contradictions, as I will discuss in that section, are additional factors that negatively affect the internal validity of Wenger's account of dimensions of practice, and have implications for how far we can apply this concept to the case of PhD students and their supervisors.

Now that I have unpacked the different parts of the dimensions of practice as discussed by Wenger (1998) and argued that the internal validity of this part of the theory should be rethought, one important question would be to see how Wenger's diagram might be represented to take into account the three shortcomings I have just mentioned. The following paragraphs are written with this aim in mind.

The first point is to clearly state that 'joint enterprise' is the overarching dimension of practice, although as I will argue in the next section on the external validity of this diagram, I will show that this is in fact quite a complex issue that requires further investigation (Figure 8.3). Joint enterprise is the dimension that brings members of a community of practice together in the first place. It is in fact prerequisite to the other

dimensions of practice, i.e., mutual engagement and shared repertoire. For instance, many of the students I interviewed were engaged in the process of doing a PhD for somehow similar purposes, although they also had personal reasons. They mentioned 'learning to become a researcher', 'learning methodology', and 'learning more about a certain topic' among others as their reasons for doing a PhD. The engineering supervisors, as I mentioned in the previous chapters, were engaging in supervising PhD students because 'they needed manpower to carry out their funded projects' or 'they had unanswered questions' and they needed their students to find answers to those questions. Notwithstanding the fact that these 'enterprises' seem to vary, all these people engaged in the same practices to achieve their objectives. I will come back to this issue later in this chapter.

Given my argument above, the first modification that I would like to make is to show the relationship between these three dimensions of practice in a way that reflects the overarching nature of the 'joint enterprise'. I will do so through two types of modalities: text, which I have already done, and visual mode: exchanging the solid lines in the original diagram by arrows, which I presume would show a hierarchy. In other words, the joint enterprise comes first, and if it is realised, it would lead to the other dimensions of practice:

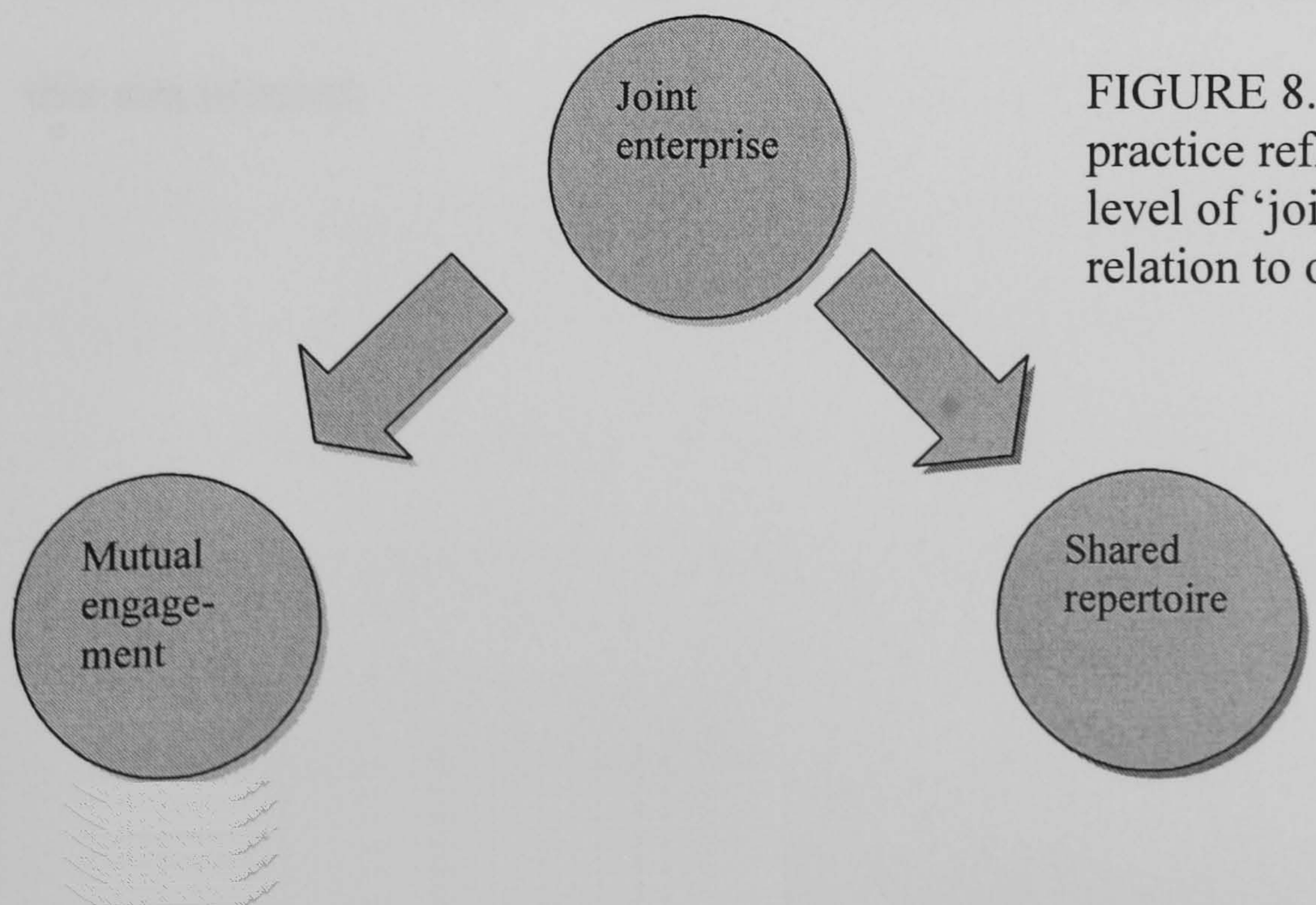

FIGURE 8.3: Dimensions of practice reflecting the higher level of 'joint enterprise' in relation to other dimensions

This first modification to the original diagram proposed by Wenger (1998), to some degree clarifies the relation among the three dimensions of practice. However, it still needs further modifications to control for the second factor that I suggested jeopardises the internal validity of the diagram. The second factor I mentioned was that the dual relationship between 'participation' and 'reification' in the theory of communities of practice has not been considered in what seems to be a translation of them in the dimensions of practice, namely, 'mutual engagement' and 'shared repertoire'. As I have already argued, these two dimensions of practice seem to be two faces of the same coin, two facets of the same entity by means of which members of a community of practice negotiate meaning. 'Mutual engagement', as I understand it, refers to whatever activities members of a community of practice indulge in to achieve their 'joint enterprise'. While 'shared repertoire' is whatever reified entities that are available to members of a community of practice to make their 'mutual engagement' possible. These are two facets of their participation. They cannot participate in their communities without both these facets. In other words, mutual engagement and shared repertoire are prerequisites for one another.

So how can we reflect this duality? Again, I would argue that we could do so by both elaborating on it more clearly, and by reflecting this in the diagram. The second modification to the original diagram of dimensions of practice is presented below with this aim in mind:

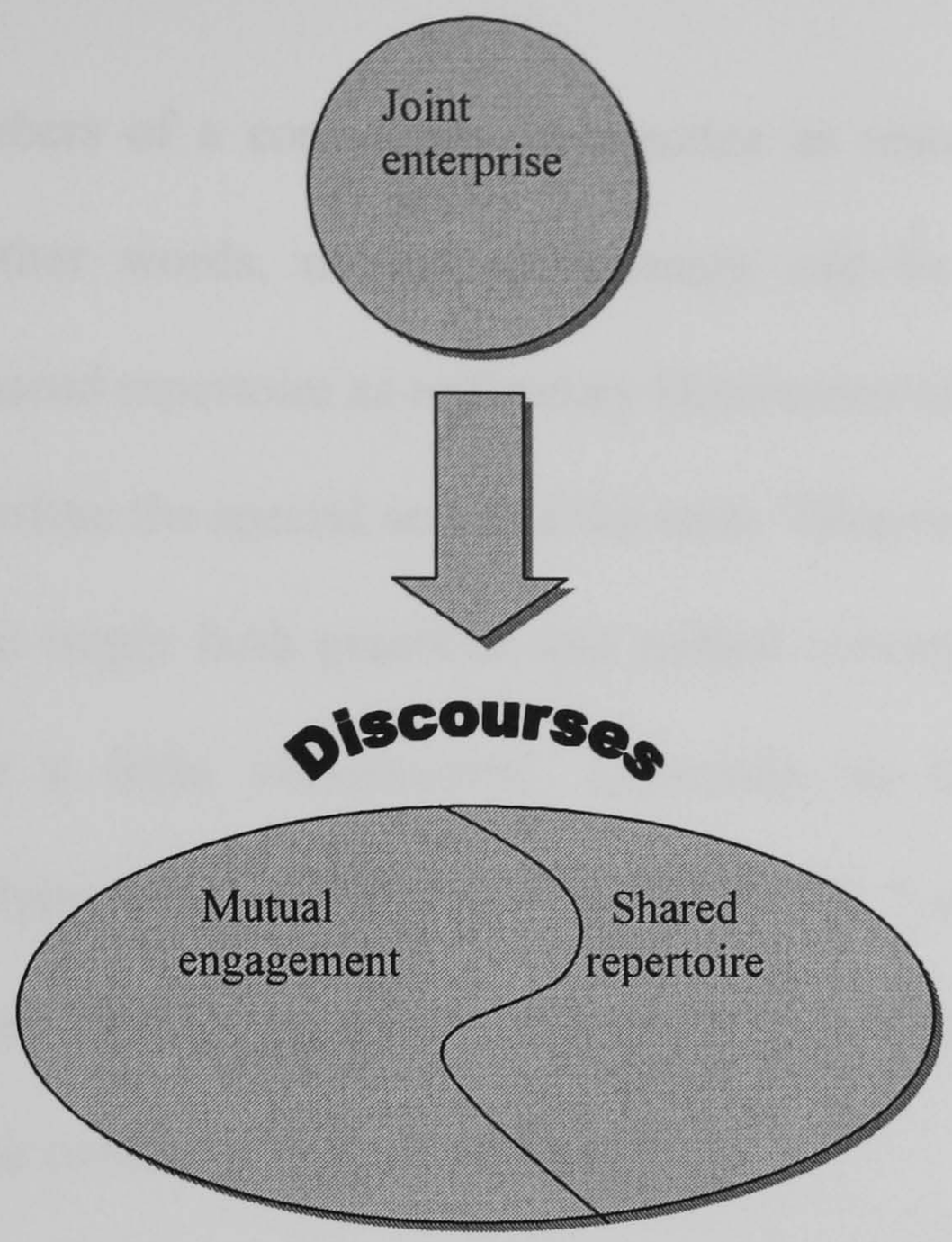

FIGURE 8.4: Dimensions of practice in a community of practice

The above diagram shows a reasonable improvement over the original diagram proposed by Wenger (1998) in that it clarifies the higher level of 'joint enterprise' over 'mutual engagement' and 'shared repertoire'. It also shows that mutual engagement and shared repertoire are in fact different facets of the same entity that members of a community of practice make use of to achieve their joint enterprise. The question that remains unanswered is, what is that entity that mutual engagement and shared repertoire are different facets of? I would argue that this entity is in fact the big D/Discourses (Gee 1996) of communities of practice. However, I would like to make a further distinction between two types of D/Discourse: procedural D/Discourses and reificatory D/Discourses. The first type of D/Discourses includes those that involve some sort of activity with their own set of rules and regulations. These include 'doing things together', and the way members relate and subsequently behave in relation to each other. The second type of D/Discourse, i.e., reificatory Discourses, are those that

are used by members of a community of practice as resources in their procedural Discourses. In other words, mutual engagement can be regarded as procedural Discourses and shared repertoire as reificatory Discourses of communities of practice. I should also underline the special sense of the term 'Discourse' in my argument here. I use this word to imply both practices and reified concepts. I understand that this choice might be a little idiosyncratic, especially as this word has taken on connotations implying only reified 'stuff'. Nevertheless, I still prefer this term in the special sense I have already explicated and hope this clarification will, to some extent, compensate for the confusion that might be caused.

The third shortcoming of the dimensions of practice can be modified by simply leaving out 'actions' from 'shared repertoire'. This will further help the diagram become a more coherent model of dimensions of practice in a community of practice.

I hope the discussion presented here has clarified the relationship among the three dimensions of practice. In the next section of the chapter, I will elaborate on what I refer to as the external validity of the model presented by Wenger (1998), though at some points I will also raise issues regarding the internal validity of the model.

8.5. The External Validity of the Model of Dimensions of Practice in Communities of Practice

As I have already pointed out, I use the term 'external validity' of a theoretical model to refer to the extent to which empirical data can be mapped onto it. In contrast to the concept of 'internal validity' discussed in the previous section, which explains the internal coherence and clarity of a model, the 'external validity' of a model actually

makes a bridge between the model and the world outside. In other words, a model or theory can be regarded to be externally more valid if empirical evidence from various sources can be fit into it. This is what I would like to discuss in this section. I will refer to different dimensions of practice as discussed by Wenger (1998) and explore the extent to which my data is congruent with them. In order to achieve this aim, I will draw upon my discussions and arguments in the previous chapters. Finally, I will end this section by suggesting a modified version of the model proposed by Wenger (1998). I will do so by taking into account both the internal and external validities of the model.

8.5.1. So What Is Joint Enterprise?

As I explained in the previous section on the internal validity of the model of dimensions of practice presented by Wenger (1998), 'joint enterprise' should be regarded at a higher level than 'mutual engagement' and 'shared repertoire'. In fact it can be conceived of as the prerequisite for 'mutual engagement' and 'shared repertoire'. This hierarchy, however, is not taken into account in the model presented by Wenger (1998).

It seems necessary to start the discussion of this part of the chapter by giving an interpretation of the features of 'joint enterprise'. Wenger (1998) includes the following as features of 'a joint enterprise': 'a negotiated enterprise', 'an indigenous enterprise', and 'a regime of mutual accountability'. Wenger (1998) argues that the enterprise of a community of practice is the result of the negotiation of that enterprise among and by members of a community of practice. He argues that this does not mean that members of a community of practice necessarily agree over all aspects of

their practice, but "that it is communally negotiated" (p. 78). In fact he sees disagreement as much productive as agreement in certain situations (p. 78):

> Their individual situations and responses vary, from one person to the next and from one day to the next. But their responses to their conditions—similar or dissimilar—are interconnected because they are engaged together in the joint enterprise of making claims processing real and livable (p. 79).

As I will show in my account of 'a regime of mutual accountability' later in this section, these two features of 'a joint enterprise, namely 'a negotiated enterprise' and 'a regime of mutual accountability', seem to be contradictory, which is in fact another pitfall of the internal validity of this model.

The next feature of 'a joint enterprise', according to Wenger (1998), is 'an indigenous enterprise'. This means that members of communities of practice themselves produce their own enterprise. This is not to say that members of a community of practice do so without being influenced by institutional constraints, but that their joint enterprise is the result of the interaction between the institutional constraints imposed upon them and their own production of their community's practice.

The third feature of 'a joint enterprise' according to Wenger (1998) is 'a regime of mutual accountability'. Wenger's (1998) account of 'mutual accountability' implies a constant sharing of information and cooperation, as is clear from the following quote:

> I have argued that, for claims processors, accountability to their enterprise includes not only processing claims but also *being personable*, treating information and resources as *something to be shared*, and being responsible to others by *not making their lives more difficult* [emphases added] (p. 81).

This is in fact contrary to 'a negotiated enterprise', which I mentioned earlier. This is because in a 'negotiated enterprise', as I have already discussed, Wenger (1998) argues that 'enterprise' is taken in the sense that the responses members of a community of practice make to their conditions are interconnected "because they engage together in the joint enterprise of making [their practice] real and liveable" (p. 79), and he mentions elsewhere that participation may involve competition and conflict as well (p.56). However, in the other feature of 'a joint enterprise', i.e., 'a regime of mutual accountability', Wenger (1998) provides a very promising picture of people in a community of practice sharing their information with other members of the community. In other words, although Wenger (1998) tries to show he is considering conflicts as well as cooperation in communities of practice, his overall account tends to overemphasise cooperation. Not only does this contradiction weaken the internal validity of the model, it also does not seem to be fully congruent with my ethnographic data on research students. Armin (an engineering student), for instance, was very dissatisfied with lack of cooperation by some students in his department:

> Well, our section is not related to NASA [laughing], but there is little cooperation in our section … there are some … people who come for short courses to work with that … supervisor, and they think they are doing a project for NASA, they are very unfriendly even with each other. Maybe it's because of certain cultural background (Armin, engineering) .

At this point I would like to bring in more data on 'a joint enterprise' from my own study, and see the extent to which they fit into the features outlined by Wenger (1998), and in the meantime I need to mention two possibilities regarding the research students and their supervisors under the present study.

The two main groups of people one might think of in the contexts I studied were the supervisors and their students. There are two options to categorise such a community. The first would be that supervisors and PhD students are both members of the same community of practice, and the second option would be that supervisors in a department form a community of practice of their own while their students form another community. I will discuss these two possibilities below.

If we take PhD students and their supervisors as forming the same community of practice, although having different positions in the community, one would come across a situation quite congruent with Wenger's (1998) concept of 'a negotiated enterprise' discussed above. In my ethnographic data I came across students and supervisors whom I categorised as 'mercenary', defining them as those who were only doing a PhD in order to earn money or further their job opportunities, as is evident from the following quotes from both the social sciences/humanities and engineering students:

> To tell you the truth, [my purpose for doing a PhD is] getting my certificate (Shahab, engineering).
>
> For me it [the purpose of doing the PhD] is only holding the title of PhD (Hamid, social sciences/humanities).
>
> So my main purpose for the time being is to get the certificate … (Shahram, engineering).

There were also supervisors and students whom I categorised as 'utopian', defining them as those who were doing research not out of career prospects, or at least only for career prospects, but because they were interested to know more and/or to push the boundaries of science further back.

I think the purpose of doing a PhD is different for different people. I myself had never wanted to do a PhD to teach at a university. I have always wanted to create an applied course, and to train students who could actually build ships. I chose to do a PhD because I wanted to find an answer to my question. I want to create opportunities for ship building. We have access to seas and oceans in our country, but we do not make use of them for fishing purposes the way we should. I think we should create facilities for fishing in the Persian Gulf and in the Caspian Sea. Foreign countries are now fishing in the Persian Gulf. Why shouldn't we do that (Ramin, engineering).

In such a context I came across engineering supervisors who assigned topics to their students (cf. *Chapter 7*) because these assigned topics were either parts of their funded projects, or because these were among the issues they were interested in but never had the time to pursue themselves. Although the immediate goals members of these communities were following were varied, their 'enterprise' was interconnected in that they had decided to approach their personal goals through the same practice. Likewise, in the case of the social science/humanities students and their supervisors, the supervisors asked their students to engage in literature reviews and write reports, and then provided them with feedback on their writing. The supervisors and their students acted as 'old timers' and 'newcomers' respectively, while the supervisors tried to help the students to attain mastery by critiquing them on their writing.

The other possibility would be to conceive of research students and their supervisors as different communities of practice, but before tackling this issue I will need to explain two concepts: 'boundary objects' and 'brokering'. According to Wenger (1998), separated but related communities of practice often overlap in their practice. This overlap is realised through 'boundary objects' and 'brokering'. Boundary objects are reified entities that are common among related communities of practice, while brokering is the participatory counterpart of boundary objects. In other words, in related communities of practice there are members who are on the borderlines of these

communities and who can actually transfer their practice from one community of practice to another:

> I will call [the] use of multi-membership to transfer some element of one practice into another brokering (Wenger 1998, p. 109).

An example may clarify the point. If we take research students and their supervisors as separate communities of practice, there are boundary objects they use to engage in their practice, such as the tools and artefacts in laboratories, reified concepts and theories they use to communicate their ideas, etc. In such a context, supervisors and their students carry over common elements of their practice from their respective communities of practice to engage in each other's communities of practice. For instance, research students indulge in the same sort of procedures such as data collection and writing the results of their research as their supervisors usually do. However, there are practices in each of these communities that are specific to them. Supervisors might be involved in practices such as participating in school committees, which are specific to them.

In sum, it can be argued that research students and their supervisors can be regarded as having a joint enterprise whether they are taken to be forming the same communities of practice or separate communities of practice. Along with Wenger (1998), I would argue that joint enterprise is taken to mean the general goal of *participating* in the same practices of a community rather than having *a reified goal* that is common among all members of the community. In other words, joint enterprise is located in the commonality of practices rather than the commonality of reified goals. Therefore, this dimension of Wenger's account of communities of practice has external validity with regard to my ethnographic data although there are anomalies in

the model itself that weakens the internal validity of the model. For instance, students I interviewed often had varied goals, from only getting a degree to pushing the boundaries of science. Supervisors, too, had a range of goals in supervising PhD students ranging from using students as 'man power' to carry out their funded projects to 'finding answers to their own unanswered questions'. In other words, the reified goals for various members were different, but they all engaged in the 'same practices' to achieve their goals. This again implies the need to highlight the 'joint enterprise' of communities of practice as the overarching feature of these communities. In addition, this is further proof that the research students and their supervisors in this study formed communities of practice.

8.5.2. Discourses

In this section of the chapter I will attempt to tackle the external validity of the other two dimensions of practice, namely mutual engagement and shared repertoire, or in fact what I have categorised as the procedural and the reificatory Discourses of communities of practice. As I argued earlier in this chapter, mutual engagement and shared repertoire are in fact two different faces of the same coin. Members of a community of practice engage in their practices by means of both of these facets of the Discourse of their communities. The first issue I will discuss, however, is mutual engagement, or the procedural Discourse of communities of practice.

8.5.2.1. Mutual Engagement

Wenger (1998), although only implicitly, refers to mutual engagement as the main dimension of coherence of communities of practice, or as he puts it, "[w]hatever it takes to make mutual engagement possible is an essential component of any practice"

(p. 74). It does not mean that communities of practice are homogeneous, but quite the reverse. According to Wenger, members of a community of practice—in his case, claims processors— come together not out of interest in the practice itself, but most probably out of instrumental interests, which reflects the 'diversity' aspect in communities of practice:

> Many applied for the job simply because they had stipulated that no previous experience was necessary and that training would be provided. Hardly anyone ever mentioned a specific interest in medical insurance as a reason for being there (p.75).

This aspect of the model Wenger builds does not correspond to my own data. As I have already shown, research students I studied can be categorised as either 'mercenary' or 'utopian'. Now if we accept that research students form communities of practice, we can argue that this is one of the weaknesses of the external validity of Wenger's model. I do not believe that anyone who is familiar with the difficulties of doing research can argue that research students join their respective communities of practice because of the low demands that these communities make on them.

Another feature of mutual engagement, according to Wenger, is 'partiality', in the sense that engagement in a community of practice does not mean that each member should know every aspect of the practice themselves, but be able to know what other members know as well. In other words, "mutual engagement involves not only our competence, but also the competence of others" (p. 76). Partiality of competence implies cooperation among members of communities of practice:

> … mutual engagement is inherently partial; yet in the context of a shared practice, this partiality is as much a resource as it is a limitation. This is rather obvious when participants have different roles as in a medical operating team, where mutual engagement involves *complementary* contributions. But it is also

> true among claims processors, who have largely *overlapping* forms of competence. Because they belong to a community of practice *where people help each other*, it is more important to know how to *give and receive help* than to try to do everything yourself [emphases added] (Wenger 1998, p. 76).

I believe that this quite explicit reference to 'giving and receiving help' in communities of practice in the above quote weakens both the internal and the external validity of the model Wenger proposes. It weakens the internal validity because, as I will explain shortly in my account of 'mutual relationship', Wenger asserts there are all different types of negative feelings and relationships among members of a community of practice, whereas in this section of the theory he takes 'giving and receiving help' as an integral part of communities of practice.

Regarding the external validity of the model, I would like to refer to my ethnographic data on competition and lack of cooperation in some cases. As I mentioned in *Chapter 5* and *6*, research communities can be quite varied regarding 'giving and receiving help'. At one extreme, there were students (Saeed) who had received a great deal of help, and at the other extreme there were students whose supervisors had to 'poke and prod' them to help each other (Refer to *Chapter 5* on Dr.e3). I believe that this conflict and how it may or may not be resolved, has not received appropriate attention in the model proposed by Wenger (1998) on dimensions of practice, and it is an aspect that I will develop further in my adaptation of the model.

The next feature of mutual engagement Wenger (1998) identifies is 'mutual relationships'. He reiterates that members of communities of practice are not homogeneous but are connected together by interpersonal relationships. He then

argues that he is not using the word 'community' in a 'positive' sense, but in a neutral sense:

> In particular, connotations of peaceful coexistence, mutual support, or interpersonal allegiance are not assumed, though of course they may exist in specific cases. Peace, happiness, and harmony are therefore not necessary properties of a community of practice. Certainly there are plenty of disagreements, tensions, and conflicts among claims processors (p. 77).

Wenger presumably refers to this special sense of community to avoid being accused of idealism, and showing that his picture of communities of practice is as realistic as possible. However, he includes so many features in 'mutual relationships' that he undermines this categorisation:

> In real life, mutual relations among participants are complex mixtures of power and dependence, pleasure and pain, expertise and helplessness, success and failure, amassment and deprivation, alliance and competition, ease and struggle, authority and collegiality, resistance and compliance, anger and tenderness, attraction and repugnance, fun and boredom, trust and suspicion, friendship and hatred. Communities of practice have it all (p.77).

This is in sharp contrast with his earlier account of 'partiality of practice' and a helping and supporting atmosphere that he draws of communities of practice. As I quoted Wenger (1998) earlier in this section, 'partiality is taken to be a resource in communities of practice where people's 'partial competences' makes them 'help each other' (p. 76). This could be taken as one of the weaknesses of the internal validity of this theory in that parts of the theory not only do not cohere but also contradict each other. However, it more or less reflects the contexts I studied. In my own data I came across tensions both between supervisors and students, and among students themselves, and also cases in which members of the community worked in close collaboration with one another. This I believe would require more investigation to

explore the extent to which these different and varied relationships might affect the smooth working of communities of practice.

8.5.2.2. Shared Repertoire

The third dimension of practice discussed by Wenger (1998) is 'a shared repertoire'. Wenger includes mainly reificative aspects in this dimension of practice although he claims to have included in it both participative and reificative:

> The repertoire of a community of practice includes routines, words, tools, ways of doing things, stories, gestures, symbols, genres, actions, or concepts that the community has produced or adopted in the course of its existence, and which have become part of its practice. The repertoire combines both reificative and participative aspects. It includes the discourse by which members create meaningful statements about the world, as well as the styles by which they express their forms of membership and their identities as members (p. 83).

I believe that Wenger has made a classificatory mistake by attempting to include both participatory and reificatory aspects in the shared repertoire. In fact one can ask: so what is the difference between mutual engagement and shared repertoire? I would argue that we could make the model presented by Wenger (1998) more coherent if we reserve participatory aspects for mutual engagement and include only the reificatory features in the shared repertoire so long as we then identify their dialogic relation. This error in classification is yet another threat to the internal validity of the model presented by Wenger (1998).

Regarding the external validity of 'a shared repertoire' as a dimension of practice, I would refer to some organisational and epistemological issues in the two sites under study, namely the social science/humanities and engineering. In the engineering sites I visited there was more or less a team-culture prevalent. As I have already discussed in

Chapter 5, the engineering students I interviewed were more or less working in teams, some working on different aspects of a bigger project, and others working on individual projects. Such engineering students, however, were again more or less connected to each other as their projects were to some degree related to their supervisors' expertise. On the other hand, the social science/humanities students I interviewed were often involved in seminar cultures, in that their main source of collaboration came from seminars in which they participated. Taking 'team-culture' and 'seminar culture' as reified entities in the two fields of engineering and the social sciences/humanities respectively, we can argue that these cultures formed part of the shared repertoire of the fields I studied. I should also say that the actual engagement in these practices could be taken as 'mutual engagement'.

The other point I would like to refer to is the apparent prevalence of positivistic epistemology in engineering.

> [Science] is knowledge of a set of things about nature or those things that man makes as technology, which are a model of nature. It is the understanding a set of rules that govern nature, or rules that govern things that man makes in the framework of technology. And research is to gain this sort of knowledge (Sharam, engineering students).

This positivistic epistemology was evident when one of my interviewees offered me a critique of my study:

> Take yourself, for example. You do all this interviewing, transcribe it, and since you will be able to gather at most 50 interviews, so you'll have limited data, and presumably no random sampling was carried out. So how much can your findings be generalized? (Farokh, engineering student)

The kind of language used in the above quotes and the concepts used—limited data, random sampling, and generalisation—clearly highlights the prevalent epistemology

in the academic discourse communities of these students as experienced by these engineering students.

This did not seem to be the case in the social science/humanities sites I visited. One of the first year social science/humanities students, for instance, had experienced that he was being exposed to a new epistemology in his studies in the UK, one that would prefer qualitative methods as tools of inquiry. I also interviewed a social science/humanities supervisor who did not believe in the tenets of positivism, but had to include some sort of quantitative element in his proposals to make them acceptable to funding bodies (Dr.h2, social science/humanities).

In sum, it seems that certain understandings of knowledge were among the shared repertoire of the fields I studied, namely the social science/humanities and engineering. However, my understanding of the concept of the shared repertoire is to include only reificatory aspects in it in order to make it more coherent and thus internally more valid. This is in contrast with Wenger's (1998) conceptualisation of this aspect of practice according to which shared repertoire includes both reificatory and participatory aspects.

8.6. A Revised Model for Dimensions of Practice

Now that I have discussed the internal and external validity of the model of dimensions of practice (Wenger 1998), I would like to bring all I have said together and present a model that reflects the communities of practice I have studied. But before that I would like to bring up an issue that is important to tackle before actually attempting to present a modified model.

As I have articulated in various parts of this thesis, I have studied two fields of study with respect to academic socialisation: the social science/humanities and engineering. I noticed some differences between these two fields of study such as the way topics of study are agreed upon, an issue that had been observed by others (Shaw 1991, among others), and the team versus seminar culture being prevalent in these two groups of fields.

The basic question is whether the differences between the social science/humanities and engineering regarding the dimensions of practice are such that they warrant different models for these two groups of fields of study. I would argue that this question is central because if we present different models for the social science/humanities and engineering, it could as well be argued that we should present separate models for each and every community that we envisage is a community of practice. This would make the theory and the model almost useless, as we would not be able to present a coherent picture that can be to some extent true for other communities of practice.

Another option would be to modify the model presented by Wenger (1998) in the light of empirical evidence from research studies on other communities of practice. This would be more profitable in that we would build upon the existing models and would continuously approach a better understanding of communities of practice. Therefore, I will attempt to present a model of communities of practice that, I would argue, reflects the dimensions of practice of the research cycles I studied in a better way (FIGURE 8.5). Throughout my argument I evaluate how the changes I have made to the model enable us to better understand communities of practice.

I have already argued that in order for the model presented by Wenger (1998) to be internally more valid, we should try to make the various parts of the model more coherent. As I argued in section 8.4, this could be achieved by making the hierarchical relationship among the three dimensions of practice explicit and showing that 'a joint enterprise' is in fact at a higher level than the other dimensions of practice. The other modification was to build into the model the idea that 'mutual engagement' and 'shared repertoire' are in fact two facets used by members of communities of practice to negotiate meaning. It can also be argued that 'shared repertoire' is yesterday's 'mutual engagement' (Skehan, personal communication). I would also like to add that it is through this process of negotiation of meaning that members learn from each other.

The other modification I would propose is concerned with the subcomponents of these dimensions of practice. One modification would be to leave out 'actions' from 'shared repertoire' for reasons mentioned in section 8.5.2.2. A second modification would be to shift the emphasis from 'features of communities of practice' to 'factors that make communities of practice function more effectively' and 'factors that hinder communities of practice from functioning effectively'. This shift in emphasis will enable us to cope with problems of internal and external validities of the model discussed earlier. Instead of putting a set of contradictory elements together as features of communities of practice, we point out positive and negative factors in communities of practice. This is of course out of the scope of the present study, but I would suggest this would be worth researching in other related projects.

Given my arguments so far, the above diagram seems to take care of the internal and external validities of the three dimensions of practice presented by Wenger (1998). The problems associated with the internal validity of Wenger's model, for instance, are dealt with by showing the overarching feature of 'joint enterprise' in relation to the other dimensions of practice. Also, the relation of 'mutual engagement' and 'shared repertoire' is made explicit by showing that they stand in a complementary relation with regard to each other. With regard to Wenger's (1998) attempt at putting a set of contradictory features next to one another, which as I have already argued weakens both the internal and the external validities of the original model presented by Wenger (1998), the revised model shown above (FIGURE 8.5) distinguishes between positive and negative features. This is, I argue, a development in the theory of communities of practice. However, as is the case with any ongoing academic debate, the revised model should be seen as 'work in progress', and further research is needed to probe into this model. For instance, it would be interesting to define 'positiveness' and 'negativeness' from the point of view of members of various academic communities of practice and to explore the extent to which these are consistent across such communities.

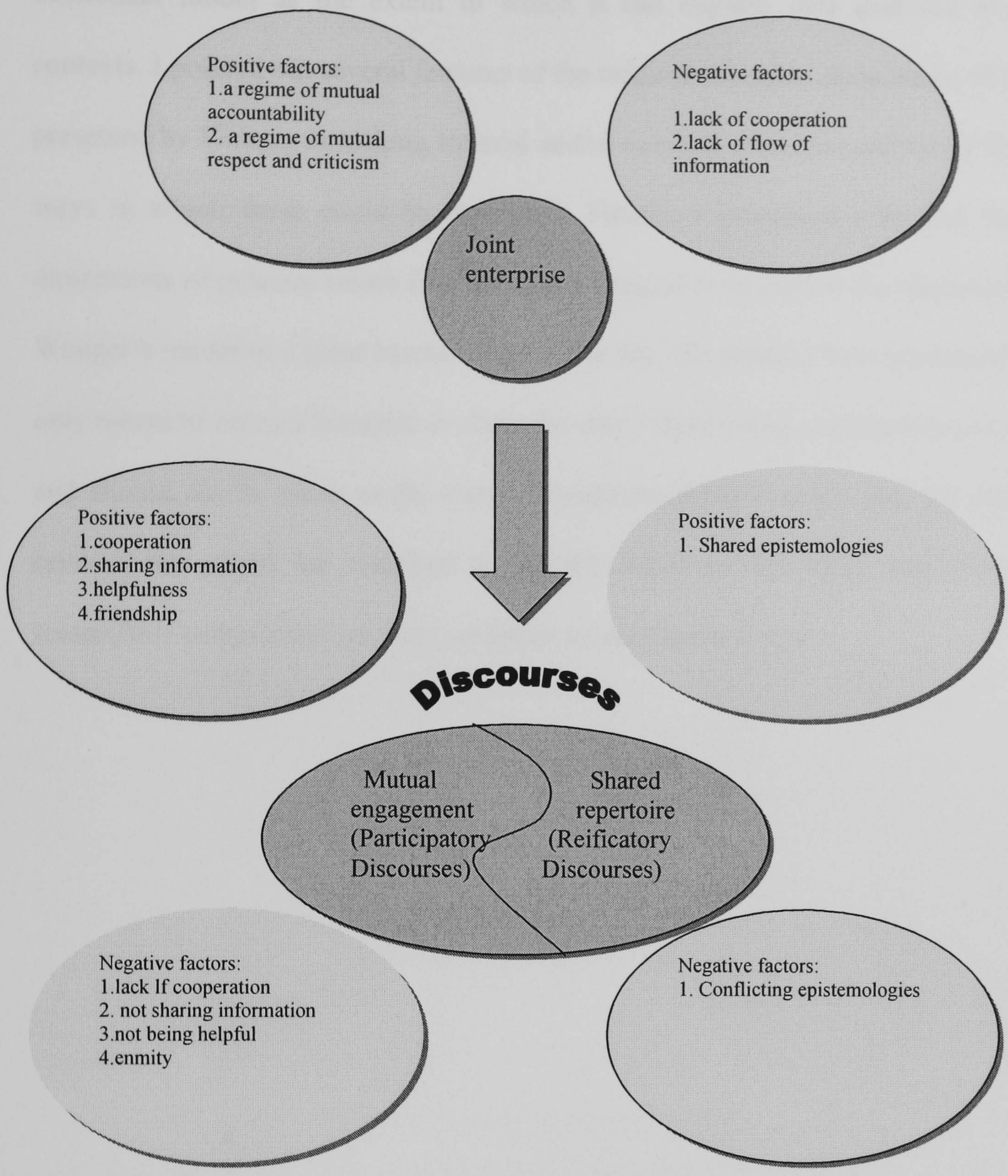

FIGURE 8.5: a modified version of the model of dimensions of practice in a community of practice

8.7. Conclusion

In this chapter I pointed out two main shortcomings of the model of dimensions of practice presented by Wenger (1998), namely internal and external validities of this model. I defined the internal validity of a model as its internal consistency and coherence as well as having no contradictions. I also defined the external validity of a

theoretical model as the extent to which it can explain data gathered in similar contexts. I pointed out several features of the original model of dimensions of practice presented by Wenger as lacking internal and/or external validities and then I discussed ways in which these could be overcome. Finally, I presented a revised model of dimensions of practice which I believe has managed to overcome the shortcomings of Wenger's model to a great extent. Needless to say, the model I have presented here is only meant to act as a heuristic to show the way I think about communities of practice and should not be taken as *the truth*. I would be pleased to see that my attempt in revising this model has managed to fuel the debate on this issue, and I hope other researchers would come up with yet better models in the future.

CHAPTER NINE

AFTERWORD

9.1. Introduction

This chapter is an attempt to bring together my research questions outlined at the beginning of this research and evaluate the extent to which I have managed to provide answers to them. I will also refer to possibilities in which this research can be expanded, and will also acknowledge the limitations of this study.

9.2. Research Questions Revisited

The research questions I had formulated at the beginning of this study were concerned with problems academic writing creates for Iranian PhD students in the UK. However, in the initial stages of my research, the focus of my study changed from the above mentioned questions to what I thought was more important than academic writing. In other words, the focus on academic writing problems suggested an ideology according to which PhD students have certain problems with their academic writing, which are fairly common across disciplines. According to this ideology, what was needed was to diagnose these problems and get them fixed, a framework that Lea and Street (1998) refer to as the study skills model of academic writing. I came to understand that academic writing is not the main issue, but probably only one aspect of a more general socialisation into academic disciplines. In other words, the change of focus that occurred in the initial stages of my research was not simply a shift of focus, but a shift in my ideological orientation on how I saw the world of academia. I understood that PhD students' struggle is not simply with learning a new language, but learning a

set of practices associated with an academic community. The following are the research questions that I formulated after this shift in my understanding of the academic context under my study:

1. How are these students socialised into their respective research communities?
2. How do they understand the norms and expectations in their disciplines?
3. How do they acquire the *Discourses* followed in their *discourse communities*?

9.3. My Answers to the Research Questions

As I have explained in *Chapters 3* and *4*, I used grounded theory and ethnographic techniques to explore the research questions of this study. It is natural that I have not covered all aspects of academic socialisation of PhD students, but given the time and resources I had, I managed to answer the research questions with some degree of success. Before writing more on my answers to these questions, I should emphasise that during this process, I learned things, and I hope, I underwent a change in my world view. I understood how to do research, how to interpret the findings, etc. But above all, I learned that what I have learned might be legitimate only within the context of my academic community. For instance, my use of a few interviews to make a thesis this size might seem surprising to those with a strong tradition in a positivistic understanding of knowledge. In the same way, people within the interpretivist camp might, and in fact do, strongly oppose the use of scientific techniques to study human beings (Griffiths 1998, pp. 37-39), and are pessimistic about claims on objective realities (Griffin 1997, p. 6). Therefore, what I have learned and have found is only relative and is the result of the world view I have acquired in the community of practice consisting of the people I have interacted with in my department. This applies

to the findings of this study summarised below. At the end of this section, I will provide a definition for the process of academic socialisation of PhD students informed by my work in this area.

I do not intend to repeat all I have written on this issue in the previous chapters, but I would argue that we can answer the research questions reiterated in the previous section if we regard PhD students as communities of practice. As I have argued in the previous chapters, the PhD students in the two disciplines under study—engineering and the social sciences/humanities—had distinctive ways of coming into contact with their academic communities. The engineering students mostly tended to be located within a team work context in which they came into contact with other PhD students, research assistants, and their supervisors. They learned a lot of the practices in their disciplines through informal interactions in these contexts. The social science/humanities students often worked on solitary projects, or projects that did not link with those of other students in a way to make their interaction necessary. They often tended to interact with other students and members of staff in seminars, but what they did in seminars was not goal oriented to the same degree that was seen in the engineering sites. What I mean by this is that the engineering PhD students interacted with one another mostly because they had immediate problems that they needed to solve through these interactions with others. In contrast, the people attending seminars do not seem to be having immediate problems to be solved, rather they come to know many practices and conceptual frameworks within their disciplines in seminars. *Therefore, one way to answer the first question, "How are PhD students socialised into their respective research communities?" is that they*

enter communities of practice and by actively participating in their practices, they eventually learn the D/Discourses (Gee 1996,1999) of these communities.

Another way the PhD students got socialised into their research communities of practice was through the help they received from their supervisors. I particularly framed the help they received from their supervisors as Legitimate Peripheral Participation (Lave and Wenger 1991) and said that the supervisors both in engineering and in the social sciences/humanities tended to engage their PhD students in research little by little, and thus helped them experience doing research. The engineering and the social sciences/humanities supervisors, however, seemed to be following this procedure in different ways. In engineering the LPP was realised in task assignment and PhD topic assignments, while in the social sciences/humanities it seemed to be realised in the form of written feedback on the students' writings. Going back to the research questions, the engineering students had the opportunity to get socialised into their research communities of practice by tasks assigned to them by their supervisors, and the social sciences/humanities students came to know part of the D/Discourses through feedback they received from their supervisors on their writing. I should add that these arguments are based on the small number of people I studied, and it is worth further exploration.

Another related aspect is the informal routes through which the PhD students under study solved their problems and learned the craft of doing research. While acknowledging the role of research training workshops and seminars as venues through which research students become familiar with the 'shared repertoire' (Wenger 1998) of their academic communities of practice, most of the instances I recorded in

my ethnographic data, most specifically with the engineering students, suggested that they often solved their immediate problems through informal ways of learning.

One of the findings that emerged in this study was the practice of topic assignment in engineering. As I explained in some detail in *Chapter 7*, the engineering supervisors under study often assigned PhD topics to their students while the PhD students in the social sciences/humanities themselves were regarded as responsible to find appropriate researchable topics. As I explained in that chapter, different epistemologies and the issue of access and students' engagement in funded research seemed to be the most important factors at work in this respect. If we accept that deciding on appropriate researchable topics requires understanding the "cutting edge" (Berkenkotter and Huckin 1995, p. 3) of disciplines, it would seem that the practice of topic assignment in engineering was more grounded on supervisors' understanding of both their discipline and of the experience of newcomers to their disciplines.

Another way of looking at PhD students is to consider them as newcomers to discourse communities. My conception of discourse is similar to that of Gee (1996, 1999), in that I do not consider it as only writing and linguistic issues. Rather I see discourse as consisting of the social practices, legitimate ways of enquiry, and accepted world views (Bizzell 1992; Connor 1996) of academic discourse communities.

Through the process, I also came to critically look into Wenger's (1998) dimensions of practice. As I explained in detail in *Chapter 8*, the idea of dimensions of practice as put forward by Wenger (1998) is problematic and requires certain modifications. In

that chapter I argued that Wenger's model is weak in terms of both its internal and external validities, and I also provided a modified version of this model.

For a detailed account of the issues reiterated above, I refer the reader to the previous chapters; however, I would like to summarise my understanding of academic socialisation as follows, which I hope will capture my answers to the three research questions of this study:

Academic socialisation is a process through which PhD students come to understand the norms, expectations, and the world view of their respective research communities of practice—including what constitute legitimate topics and methodology and how these should be agreed upon. They often learn the social practices through informal routes, participation in social practices, and in interactions with each other, although formal workshops and seminars also play a role especially for the social sciences/humanities students. They learn many of the tricks in their fields through the process of Legitimate Peripheral Participation (LPP).

The above definition is by no means complete. This is because my work in this study can be regarded as my first step in understanding academic socialisation of PhD students, and I hope this line of research will continue to develop in the coming years.

9.4. The Limitations of the Study

While I was trying to write something under this title, I tried to understand why it is essential in the first place to have something written under this title. I think PhD candidates write this section in their theses because they have seen others do so and this has become part of the 'shared repertoire' of their communities of practice. To make this section of PhD theses problematic is out of the scope of this research, but I

believe researching the function that specific sections of theses perform in the overall structure of theses will be both interesting and helpful in understanding Higher Education in general and academic socialisation in particular.

One of the limitations of this study is the fact that all the students I interviewed were from Iran. As I explained in *Chapter 1*, there was a historic reason behind this, in that I started to do research on the academic writing problems on the Iranian PhD students in the UK, but a shift occurred in the focus of my study throughout the initial phases of the study when I was collecting data. At that point I had enough data to follow on my arguments, but not enough resources to study PhD students from comparable backgrounds. This might have implications for the results of this study, as it might be argued that these students' cultural backgrounds have influenced the outcomes of the study. If I were to do the same study again, I would have selected the students across a range of different backgrounds. For instance, I would have selected both home and overseas student to explore the issues. Nevertheless, the present work could be regarded as a first step into understanding academic socialisation of PhD students within the framework of communities of practice, and it will hopefully lead to more comprehensive studies in this area in the future.

9.5. Implications for Further Research

The piece of research presented in this thesis, I hope, has created a framework to look at some aspects of the academic socialisation of research students. I do not intend to argue that I have managed to show all aspects of this complex issue clearly, nor do I intend to argue that the findings of this research can be totally generalisable to other similar contexts. However, I would argue that this research study has served one of

the important purposes of doing research, in that it has led to many questions that are worth investigating. I will point out some of these questions below.

1. One of the questions raised by this study is to investigate whether PhD students and their supervisors are functioning in the same community of practice or in separate communities of practice, as experienced by them. The unit of analysis for such a study would be the experience of students and their supervisors, and one could expect interesting results regarding the contested nature of this experience. One possible methodology for such a study would be ethnography, using mainly interviews, and doing the analyses on the basis of the principles of the constructivist version of grounded theory (Charmaz 2000).

2. In this research study I have argued for a modified model of dimensions of practice hypothesising that some factors lead to communities of practice functioning better and factors that negatively affect the functioning of communities of practice. One interesting study would be to investigate these presumably negative and positive factors. The point of departure for ascertaining 'negative-ness' and 'positive-ness' would create much interesting research. One could argue, for instance, that these can be ascertained 'etically', i.e., as determined by the 'researcher', while it could also be argued that these can be done 'emically', i.e., as experienced by the 'researchees', although what counts as positive or negative would vary across different groups.

3. I have referred to the practice of giving and receiving feedback of the written assignments of Iranian Social science/humanities PhD students. There have also been other studies regarding this issue on native speaker students (Lea and Street 1998). It

would be interesting to investigate the differences between the English speaking and the non-English speaking PhD students and their supervisors regarding giving and receiving feedback on written assignments. This study will have practical aspects as well, because one can anticipate uncovering some of the hidden aspects of learning in doing a PhD that seem to have gone unnoticed in research training workshops specifically designed for PhD students.

4. One of the features in the theory of communities of practice that has not received adequate attention is 'change'. Wenger (1998) mentions 'change' as a process one should expect in a community of practice, but the only sources of change he refers to are institutional (pp.93-95). It could be argued that change can also be caused by the members themselves, or in this case, research students and their supervisors. One hypothesis would be that change would emerge from 'mutual engagement' rather than 'shared repertoire'. Therefore, some questions worthy of further investigation would be "(1) what effects can members of communities of practice have on their communities? (2) How are these changes experienced by research students and supervisors? (3) How do changes in 'mutual engagement' transfer to 'shared repertoire'?

5. The social sciences/humanities research students I studied showed features of a seminar culture in their spectres, which I have discussed in some detail in the previous chapters. However, the social sciences/humanities students I interviewed were from education, history, art, anthropology, and historical linguistics. It would be interesting to study students in other social science fields such as economics and psychology to see if the seminar culture is present in those fields as well.

9.6. Final Remarks

Many times when I was giving seminars about my research, people smiled and suggested that I could do participant observation to do the research as I was in the process of doing a PhD myself. Looking back on this sort of remark, two points come to my mind. The first point is being a PhD student and researching the process of academic socialisation of a group of PhD students can be both an advantage and a disadvantage. It is an advantage because the researcher themselves is actually going through the same process and can make use of their own experience as a resource to interpret the contexts under study. In fact as they are an insider, they can understand the research students better. However, it could also be a disadvantage in that the researcher, who has not yet come out of the process, may not be able to have a bird's eye view of the PhD process and different aspects that it involves. As a result, they might not be able to fully appreciate the situation. The fact is that there are advantages and disadvantages to both situations. This research is the result of the study of a research student—me—of a group of research students. It would be interesting to see how a comparable study by a person who is not a research student might contribute to the findings of the present study.

APPENDIX I
CODED DATA USING QSR.NUDIST:

INTERVIEWS WITH SUPERVISORS

(1) /Discourses
(1 1) /Discourses/epistemologies
(1 1 1) /Discourses/epistemologies/PhD purposes
(1 1 1 1) /Discourses/epistemologies/PhD purposes/mercenary vs. utopian
(1 1 1 2) /Discourses/epistemologies/PhD purposes/writing technical papers
(1 1 1 2 1) /Discourses/epistemologies/PhD purposes/writing technical papers/situatedness of writing
(1 1 1 3) /Discourses/epistemologies/PhD purposes/initiation right
(1 1 1 4) /Discourses/epistemologies/PhD purposes/research training
(1 1 1 5) /Discourses/epistemologies/PhD purposes/PhD purposes from institutions' perspectives
(1 1 1 5 1) /Discourses/epistemologies/PhD purposes/PhD purposes from institutions' perspectives/financial
(1 1 1 5 1 1) /Discourses/epistemologies/PhD purposes/PhD purposes from institutions' perspectives/financial/supervisor's opinion
(1 1 1 6) /Discourses/epistemologies/PhD purposes/PhD purposes from supervisors' perspective
(1 1 1 6 1) /Discourses/epistemologies/PhD purposes/PhD purposes from supervisors' perspective/unanswered questions
(1 1 1 6 2) /Discourses/epistemologies/PhD purposes/PhD purposes from supervisors' perspective/long term objectives
(1 1 1 6 3) /Discourses/epistemologies/PhD purposes/PhD purposes from supervisors' perspective/problem clarification
(1 1 1 6 4) /Discourses/epistemologies/PhD purposes/PhD purposes from supervisors' perspective/solving a problem
(1 1 1 6 5) /Discourses/epistemologies/PhD purposes/PhD purposes from supervisors' perspective/students developing
(1 1 1 7) /Discourses/epistemologies/PhD purposes/topic role
(1 1 1 8) /Discourses/epistemologies/PhD purposes/teaching undergraduates
(1 1 1 9) /Discourses/epistemologies/PhD purposes/learning through teaching
(1 1 1 10) /Discourses/epistemologies/PhD purposes/thesis
(1 1 1 11) /Discourses/epistemologies/PhD purposes/doing research
(1 1 1 12) /Discourses/epistemologies/PhD purposes/ability to give seminars
(1 1 2) /Discourses/epistemologies/tools of research
(1 1 3) /Discourses/epistemologies/ablolute standards
(1 1 4) /Discourses/epistemologies/dissemination of knowledge
(1 1 4 1) /Discourses/epistemologies/dissemination of knowledge/teaching
(1 1 4 2) /Discourses/epistemologies/dissemination of knowledge/learning
(1 1 4 3) /Discourses/epistemologies/dissemination of knowledge/research papers
(1 1 5) /Discourses/epistemologies/theoretical vs. practical research
(1 1 5 1) /Discourses/epistemologies/theoretical vs. practical research/America vs. UK

(1 1 5 1 1)	/Discourses/epistemologies/theoretical vs. practical research/America vs. UK/reasons for lack of funding
(1 1 6)	/Discourses/epistemologies/computing vs. sciences
(1 1 7)	/Discourses/epistemologies/social constructionins
(1 1 8)	/Discourses/epistemologies/positivism
(1 1 9)	/Discourses/epistemologies/cross-cultural differences in understanding science
(1 2)	/Discourses/student-supervisor relationships
(1 2 1)	/Discourses/student-supervisor relationships/topic change
(1 2 2)	/Discourses/student-supervisor relationships/assignment of topics
(1 2 2 1)	/Discourses/student-supervisor relationships/assignment of topics/tensions over assignment
(1 2 2 1 1)	/Discourses/student-supervisor relationships/assignment of topics/tensions over assignment/compromise
(1 2 2 2)	/Discourses/student-supervisor relationships/assignment of topics/rigid vs. moderate supervisors
(1 2 2 3)	/Discourses/student-supervisor relationships/assignment of topics/types of assigned topics
(1 2 2 3 1)	/Discourses/student-supervisor relationships/assignment of topics/types of assigned topics/first priority
(1 2 2 3 1 1)	/Discourses/student-supervisor relationships/assignment of topics/types of assigned topics/first priority/students' interests
(1 2 2 3 2)	/Discourses/student-supervisor relationships/assignment of topics/types of assigned topics/second priority
(1 2 2 3 3)	/Discourses/student-supervisor relationships/assignment of topics/types of assigned topics/supervisor topics
(1 2 2 3 4)	/Discourses/student-supervisor relationships/assignment of topics/types of assigned topics/funded topics
(1 2 2 3 5)	/Discourses/student-supervisor relationships/assignment of topics/types of assigned topics/students topics
(1 2 3)	/Discourses/student-supervisor relationships/role reversals
(1 2 4)	/Discourses/student-supervisor relationships/supervisor responsibility
(1 2 4 1)	/Discourses/student-supervisor relationships/supervisor responsibility/help with writing
(1 2 4 2)	/Discourses/student-supervisor relationships/supervisor responsibility/not writing
(1 2 4 3)	/Discourses/student-supervisor relationships/supervisor responsibility/pushing students
(1 2 5)	/Discourses/student-supervisor relationships/successful students
(1 3)	/Discourses/communities of practice
(1 3 1)	/Discourses/communities of practice/lonely reseacher
(1 3 2)	/Discourses/communities of practice/from dependence to independence, scaffolding
(1 3 3)	/Discourses/communities of practice/scaffolding
(1 3 4)	/Discourses/communities of practice/working together
(1 3 5)	/Discourses/communities of practice/learning by doing
(1 3 6)	/Discourses/communities of practice/student-student relationship
(1 3 6 1)	/Discourses/communities of practice/student-student relationship/competition
(1 3 6 2)	/Discourses/communities of practice/student-student relationship/learning from other students
(1 3 6 3)	/Discourses/communities of practice/student-student relationship/cooperation
(1 3 6 3 1)	/Discourses/communities of practice/student-student

	relationship/cooperation/supervisor's view
(1 3 6 3 2)	/Discourses/communities of practice/student-student relationship/cooperation/supervisor's role
(1 4)	/Discourses/supervisor strategies
(1 4 1)	/Discourses/supervisor strategies/initiation
(1 4 1 1)	/Discourses/supervisor strategies/initiation/machiavellian
(1 4 1 2)	/Discourses/supervisor strategies/initiation/citation index
(1 4 1 3)	/Discourses/supervisor strategies/initiation/novice students
(1 4 1 4)	/Discourses/supervisor strategies/initiation/task assignment
(1 4 2)	/Discourses/supervisor strategies/methodological PhDs
(1 5)	/Discourses/practices
(1 5 1)	/Discourses/practices/students' written reports
(1 5 1 1)	/Discourses/practices/students' written reports/supervisor feedback
(1 5 1 2)	/Discourses/practices/students' written reports/overseas vs. home students
(1 5 1 2 1)	/Discourses/practices/students' written reports/overseas vs. home students/error types
(1 5 1 3)	/Discourses/practices/students' written reports/computers
(1 5 2)	/Discourses/practices/PhD years
(1 6)	/Discourses/textbook vs. articles
(1 7)	/Discourses/funding
(1 7 1)	/Discourses/funding/manager-like supervisors
(1 7 2)	/Discourses/funding/researcher-type supervisors
(1 8)	/Discourses/socialisation
(1 8 1)	/Discourses/socialisation/bidirectionality
(1 8 2)	/Discourses/socialisation/physical and social inculcation

APPENDIX II
CODED DATA USING QSR.NUDIST:

INTERVIEWS WITH STUDENTS

(1)	/epistemologies
(1 1)	/epistemologies/dissemination of knowledge
(1 1 1)	/epistemologies/dissemination of knowledge/articles
(1 2)	/epistemologies/conception of knowledge
(1 3)	/epistemologies/topics
(1 3 1)	/epistemologies/topics/change of topic
(1 3 2)	/epistemologies/topics/change of methodology
(1 3 3)	/epistemologies/topics/types of topics
(1 3 3 1)	/epistemologies/topics/types of topics/sv topics
(1 4)	/epistemologies/books vs. papers
(1 5)	/epistemologies/admissions
(1 6)	/epistemologies/initiation
(1 7)	/epistemologies/Iranian issues
(1 7 1)	/epistemologies/Iranian issues/Iranian Problems with research
(1 7 1 1)	/epistemologies/Iranian issues/Iranian Problems with research/time limitations
(1 7 1 2)	/epistemologies/Iranian issues/Iranian Problems with research/upgrade report
(1 7 2)	/epistemologies/Iranian issues/MCHE policies
(1 7 3)	/epistemologies/Iranian issues/unmet expectations
(1 8)	/epistemologies/computing vs. other engineering fields
(1 8 1)	/epistemologies/computing vs. other engineering fields/UK vs. US
(1 9)	/epistemologies/positivism
(1 10)	/epistemologies/PhD purposes
(1 10 1)	/epistemologies/PhD purposes/business-type students
(1 10 2)	/epistemologies/PhD purposes/PhD outcomes
(1 10 3)	/epistemologies/PhD purposes/heroic students
(1 10 4)	/epistemologies/PhD purposes/PhD process
(2)	/funding
(2 1)	/funding/funded projects
(3)	/language issues
(3 1)	/language issues/language problems
(3 2)	/language issues/thesis
(3 3)	/language issues/oral reports
(3 4)	/language issues/written reports
(3 4 1)	/language issues/written reports/email reports
(3 4 2)	/language issues/written reports/writing process
(3 4 3)	/language issues/written reports/supervisor feedback
(3 5)	/language issues/writing process
(4)	/supervisor-student relationships
(4 1)	/supervisor-student relationships/background
(4 2)	/supervisor-student relationships/non-assignment
(4 3)	/supervisor-student relationships/assignment
(4 4)	/supervisor-student relationships/supervisor pressures
(4 5)	/supervisor-student relationships/initiation
(5)	/communities of practice
(5 1)	/communities of practice/learning from others
(5 2)	/communities of practice/competition
(5 3)	/communities of practice/helping each other
(5 4)	/communities of practice/days spent in college
(5 5)	/communities of practice/mixing with others
(5 6)	/communities of practice/doing things together
(5 6 1)	/communities of practice/doing things together/sv role

	in students working together
(5 6 2)	/communities of practice/doing things together/problems in working together
(5 7)	/communities of practice/from certainty to uncertainty
(5 8)	/communities of practice/lonely researcher
(5 9)	/communities of practice/scaffolding
(5 10)	/communities of practice/determination
(6)	/reading process

APPENDIX III

PART OF AN INTERVIEW WITH AN ENGINEERING SUPERVISOR AS CODED BY ME AND FIVE OTHER PHD STUDENTS USING QUALITATIVE METHODS

	TEXT	PARVIZ	SUSAN	JANE	JOHN	CAROL	EVE
	What is science?				Unexpected question		
	Science; physics;	Epistemologies			Positivistic conception of science		
	Fundamental behaviour				?		
	Teaching; learning; writing papers *	Ways of transferring knowledge		Teaching as telling vs. learning by practice	teaching vs. learning	Teaching vs learning	Dissemination
	If people actually learn to do sth rather that being taught to do sth *	Teaching vs learning	Expectations of students	Learning by practice			Active as against passive learning
	It's easy to sit down and tell them what to do			Learning by telling what to do	Teaching as telling		Teaching as telling
	Telling them what they should look at			Telling them to look	Teaching as telling		Teaching as telling
	Telling them what analyses they should perform			Telling them to do certain analyses	Teaching as telling		Teaching as telling
	I tend not to teach them, I tend to tell them what it is I want them to	Supervisor strategies		Telling them to look	Teaching by constraining	Teaching vs. telling	

	look at						
	I want them to look at	Assignment					
	They have to be trained as a graduate teaching assistant	Epistemologies		Training as a teaching assistant	Learning by teaching		
	You will only know your subject well if you can actually listen to sb who doesn't know it	Learning through teaching		Understanding by listening to newcomers	Contrast knowing and not knowing		Teaching As Listening
	And that's why we do it			reasons for using students as teachers			
	…It's very easy for PhD students				The use of easy seems potentially important for this supervisor		
	It doesn't matter which office…it's the whole environment of the office	Social vs. hermit				Written context	
	Take part in the life of London	Social vs. hermit			Becoming		
	Ought/ accept/ take part	Social vs. hermit			Ought/ expectation Benign		

	From the point of view of tudents o from the point of view of supervisor?						Interesting He suggests he can speak from point of view of students	
	I think the most important reason is…financia l…we are expected by our masters to have PhD students *	PhD purposes from institutions' perspectives	Expectatio ns of supervisor s	Extended constraint, also career benefits for supervisors			Financia l/fundin g policy	External financial elements
	That's a very cynical opinion	Supervisor opinion about institutions' policies						
	I have lots of questions I need answering	Assignment: Supervisors' unanswered question			Career benefits for the superviso r			Fitter on research knowledge
	I need sb to help me answer my questions, which is what my PhD students do. And in the process they learn how to undertake	Assignment: Supervisors' unanswered questions			Career benefits for the superviso r		Apprent iceship	Teach research methods

	research						
	There's two ways I actually assign topics	Assignment					
	If a student arrive her…with a very very definite idea	1st priority in choosing topics					
	And I'll supervise him or her and make sure they are going in the right direction		Expectations of supervisors				
	Those dark days in the middle of the second year	Needs further thought	Imagined/ projected experience of students				
	…it's absolutely important that the students believe in their own subjects	Students' interest in their own topics					
	So if a student arrives who doesn`t have …a topic, the first thing I do is sit down with	2nd priority in choosing topics	Expectations of supervisors			Needs of students	

	them and talk about their interests and their background						
	And it's of paramount importance that the student actually …feels as if it's their…problem…not my problem. If they think they're working for me solving my problems, they won't.	Students' interest in their topics				Needs of supervisors/ Who owns the problem?	
	It's got to be theirs, and they've got to have that feeling of needing to solve it	Students' interest in their topics	Expectations of students				
	The key to it is making sure that the student actually wants to undertake it	Students' interest in their topics					
	And if a student doesn't own the problem, they will not get a good solution to it		Feelings about how to do PhD				

	There are the same tools to be used regardless of the topic in our field	Epistemologies: Tools of research					
	The first year of the PhD is actually understanding the problem	Research steps	Imagined/ projected experience of students			His view of PhD as solving a problem indicates a particular epistemological stance	
	There is a problem here and that we've to try and resolve it	Initiation strategies	Imagined/ projected experience of supervisor			Constant reference to problems	
	The first thing I would do is actually be somewhat machiavellian	Initiation strategies	Imagined/ projected experience of supervisor				
	So…if there's a problem that I've been thinking of for a few years…	Initiation strategies				Student as worker	
	I can soon determine that it's unsatisfactory		Imagined/ projected experience of supervisor				

			s			
	And…then …make them realise …they've …not tackled the problem properly…		Expectations of students			
	…Not look at textbooks, they have to look at research papers…	Discourses: Textbooks vs. articles				
	I almost encourage them to make mistakes, so that I can tell them what they should be doing	Initiation strategies	Expectations of supervisors			
	[I] teach them about modern tools like the science citation index	Initiation strategies				
	Science citation index is probably two or three million times better than the paper version		Imagined/ projected experience of supervisors			
	I will show them how in two minutes….they could have found		Imagined/ projected experience of supervisors			

	far more						
	And that's usually quite a shock for them		Imagined/ projected experience of students				
	…the only method for examining a PhD is…a written report	Discourses: Importance of writing				Power structure between supervisors+student	
	Writing a report that is of the correct standard	Standard of academic writing					
	[not to] lead themselves into difficulty during the oral examination		Imagined/ projected experience of students				
	That's always a shock to them when they realise they've got to produce a report of 200-250 pages		Imagined/ projected experience of students				

APPENDIX IV

*INTERVIEW WITH DR.E3 4/12/2000

*P
First of all thank you very much for accepting to take part in this interview, Dr.e4. Could you please tell me what you think science is, and how do think science can be transferred?
*H
What science is?!…
*P
In your own discipline, in fact.
*H
Science in our own discipline is actually trying to understand the fundamental behaviour of rocks and rock matters…in an engineering context. So the science we are investigating, I suppose, is primarily physics, the physics of rocks and fractured rock matters.
*P
And how do you think it can be transferred?
*H
I think there's two ways that we can …erm…transfer it. The customary way is by teaching, but …and obviously by …by writing papers and things… . I think the best way of transferring it is by learning. …If people actually learn to do something rather than being taught to do something, they will have a far better understanding of [*3] the science. And that's not only at the PhD level but that's at all levels. So if we…primarily look [fs]…take PhD students, it's very easy to sit down and tell them what to do,… tell them what they should look at, tell them what analyses they should perform. But it's only by learning that they will actually fully understand and appreciate what it is. So in fact I tend not to teach them. I tend to just tell them what it is that I want them to look at, and then give them a hard time when they don't do it. I also think it's very important that they actually help teaching undergraduate students, so that they all teach undergraduate students, and they have to be trained as a graduate teaching assistant, and that then means that they can assist with tutorials. And the reason for that you will only know your subject well if you can actually listen to somebody who doesn't know it, and actually help them to understand it. And that's why we do it that way.
*P
In other words creating an atmosphere, and appropriate atmosphere for PhD students to learn…
*H
Yeah, absolutely. And it's very easy for a PhD student to come to College D, or anywhere else for that matter, and just sit in an office for three years and hopefully get a PhD and then leave…and it doesn't matter which office you're sitting in, they're all the same, they've all got walls, doors, and it's not just the office, it's the whole environment of the office, for example, in central London. I mean for in central London we ought to try and make sure that the students accept…not accept…erm…erm…take part in the life of London. So yeah it's the whole environment.
*P
Can I ask you, as the next question, what you think the purpose of doing a PhD is?
*H
From the point of view of the student or from the point of view of the supervisor?
P: From the point of view of the supervisor, of course.
*H
Right. From the point of view of the supervisor, erm…there are two reasons…two reasons. Erm… one is…and this is, I think is probably the most important reason at the moment but shouldn't be, and that is that erm…that current …, I suppose it's my view, …my view is that the current financial circumstances under which we find universities working, we are expected by our masters to have PhD students. So that they can turn round at the end of the year and say the average number of PhD

students is 2.6 across the College D. That's,... I mean that's a very very erm...cynical opinion, but nonetheless I do think that's the way that universities have been driven. Why do I do it. I do it for the simple reason I have lots of questions I need answering, and I haven't got time to do them myself. And so I need to take on somebody to help me answer my questions, which is what my PhD students do. And in the process they learn how to undertake research.
*P
So this brings into the picture the relationship which is created [H: Yeah] between supervisors and students [H: Yeah], in fact the way you ask them to do the questions. And so it brings into the picture the assignment of topics by supervisors. Will you please elaborate on that a bit more?
*H
Yeah, erm...I mean [fs] there's two ways that I actually assign topics. One is that if a student arrives here, and I have a Korean student at the moment who arrived with a very very definite idea of what he wanted to do, why then not to? I'll allow him to get on with it. And I'll supervise him or her and make sure they are going in the right direction. But if they've got a very definite idea, I'll leave them to that. The overriding aspect is that three years is a long time in which to work on one subject. And in the middle of a PhD during those dark days in the middle of the second year, where you don't seem to be making any progress, where what progress you do seem to make you soon discover somebody else has already made it ...erm.. unless you are very very keen on your subject, you'll easily walk away from it and not finish. So it's absolutely important that the students believes in their own subjects they start with, and that they're very interested in it, and that they've got a definite wish to see the answer. So if a student arrives who doesn't have... a topic, the first thing I do is sit down with them and talk about their interests and their background and their...prior education, and hopefully also prior work...work experience, to find out exactly what thing [fs] what problems they've encountered, and how [fs] whether they would like to solve them or not. And I also of course try to make sure that it's something I'm interested in. And that's how we choose the subject matter. And it's of paramount importance that the student actually ... feels as if it's their... problem, not my problem. If they think that they're working for me solving my problems, they won't. It's got to be theirs, and they've got to have that feeling of needing to solve it.
*P
And which type of topics do you think is more successful at the end of the day? Those proposed by the supervisor or those students who have their own topics?
*H
No difference, no difference. Erm...providing [fs]... and the key to it is making sure that the student actually wants to undertake it. If [*2] I sat down with two students, one who turned up with a definite idea of their own, somebody who turned up with no idea, but having spoken with them, we'd agreed on a specific topic, but they are very happy with that topic, there would be no difference between the two. Where there would be the difference is if the student came in, sat down with no idea, we had a discussion, still no ideas, at that point, I then said, I think this is what you should do. And if a student doesn't own the problem, they will not get a good solution to it, or any solution at all.
*P
So, in fact, suggesting, whether explicitly or implicitly to the students their topics, do you think it also implies a set of or a bunch of methodological tools which comes together with their topics?
*H
Not necessarily. Well, I mean yes, I suppose it does...in there is [fs] there are the same...the same tools to be used regardless of the topic in our field. I mean it's the usual thing that you initially have to ...erm...investigate what is currently being written about...and investigated in terms of that problem. So that you can then actually identify the problem. As I say to students, the first year of the PhD is actually understanding the problem. At the end of one year, then they will actually be

able to succinctly write what the problem is. Once they know what the problem is, they can then get to answer to it. So that the first year is actually spent trying to get the question. And the tools used are the same regardless of the topic, and totals up a review of ... previously written material.
*P
May I ask you as the next question, what type of initiation strategies you use in order to initiate students into research, in fact?
*H
Erm...I tend to ...erm...I [*3]...if it's a topic of my own choosing or one that we have chosen jointly but obviously one I'm interested in, clearly this is going to be a topic that's been exercising my mind for sometime, then I will think there is a problem in here and that we've to try and resolve it, or improve our current state of knowledge or methods of working. Erm, so if it's [fs] if I'm trying to deal with a student or I am dealing with a student who has no idea at all about this particular subject matter, whether that they may be interested in it...this know [*2] the names. Erm. ..the first thing I would do is actually...be somewhat machiavellian...in that I would set them short assignments for which I already knew the answer. Because then I can determine just what level of self-motivation and [*2] deep thought they bring to it. So, obviously if it's a problem that I've been thinking of for a few years, I will be aware reasonably well of the current state of the arts, and key persons, and things like that. And then I would then probably say over the next two weeks I'd like you to go and review a certain aspect of this topic, and then write a two-page report, and we'll sit down and talk about this when you're [fs] in two weeks' time. So that when they arrive, I can look at something fully expecting it to be completely unsatisfactory. And because I know what I'm looking for, I can soon determine that it is unsatisfactory. And at that point I can then start asking some very probing questions from the students as to where did they find the information, why did they think it was this particular..., why did they draw these conclusions, and so on. And that then makes them realise that they've usually, generally not tackled the problem properly. So for example an initial approach by the student will be to look at the textbook, which is what undergraduate students do, but obviously research students have got to, in essence, not look at textbooks, they have to look at research papers, things that have been published on in the last two to three years, so they won't be in textbooks. And that's a big lesson that they have to learn. And I ask them [fs] I actually allow them to make mistakes. In fact I almost encourage them to make mistakes, so that I can then tell them what they should be doing. And it then makes them realise that textbooks have got no real part in scientific research.
*P
But, the journals and article...
*H
Journals and article, that's the key to it. And then also learning [fs] teaching them not teaching how to use but teach them about modern [*2] tools like the science citation index as available on the internet, and the electronic version of the science citation index is [*3] probably about... er ...two or three million times better that the paper version. I mean where it's possible to do things with the electronic version that it just wasn't possible to do with the paper version. And it's usually quite a shock to the students to discover how quickly they can get the relevant literature once they've been exposed to it. And again I tend to sort of set them to something for two weeks to try get some sort of answer, some sort of short report, erm...they'll essentially be looking at textbooks, and then we'll sit in my office and I will show them how in two minutes sitting in front of a computer, using the science citation index over the internet, they could have found out far more. And that's usually quite a shock for them and the benefit of this of course is that they then go away thinking, my god I'd better use this again, which they do.
*P
You mentioned writing reports as a reflection of what they have been looking for. so this shows that writing is one of the crucial parts of doing a PhD...

*H
Absolutely [*2]. It has to be for the simple reason that the only method for examining a PhD at the College D is that you will produce a written report called a thesis, and you will also be given an oral examination on that report. Now as I keep telling my students, I've already got my PhD. I've already written my thesis, I'm not writing any more, they've got to write it. And it's my job as a supervisor to first of all make sure that they are writing a report that is of the correct standard. And I will also make sure that they are not making any errors...not errors...I mean that they are not writing in such a way that they are liable to... erm...lead themselves into difficulty during the oral examination. So that my job as the supervisors is to make sure that they are writing something of the appropriate standard. And I'm not going to write it for them. And it's as simple as that.
*P
Can you please tell me about that appropriate standard, and how you tell them what that appropriate standard is?
*H
Erm... Yeah, it's [fs]...I mean ...actually showing people what an appropriate standard is [*3] really quite simple. Erm... because they are always using journal articles, high quality papers, and we know what the best papers are, so we know what the best journals are. So very quickly, within a year or so, they can soon tell the difference between the various journals. And they know what a good quality paper is in terms of the way it's written, the way it's structured, erm...the [*3] process of developing the argument. So they can see all of this through looking at the journal article. And of course we've also got the past PhD theses for them to look at. So again a [*5] very fruitful source of information for a PhD student is a PhD that's just finished, because there is a thesis. So they can see what they've got to aim at. That's always a shock to them when they realise they have got to produce a report of say 200- 250 pages, but ... about a subject the academic level of which is far higher than anything they have ever encountered before. When one actually sits down and reads a PhD thesis about a scientific subject, it is essentially unintelligible, because the level at which it is written is just far beyond your knowledge. Erm... and that then makes them realise what they've got to get to. And so there's a ...generally there's a huge amount of work needed, not from my point of view but from the students' point of view, to actually get themselves to that level.
*P
And ...does any type of feedback or comment appear on those written reports of the students by you?
*H
No, because I debrief them. I debrief them verbally. I don't actually write anything on the reports. I mean it's not like ...it's not a high school class where I am going to mark it. These guys, I believe, should be working at...erm... I think ...I think the best way of summarising it is the strange relationship between a supervisor and the student. And that's when the student first arrives, erm... they will know ...5% of the problem and the student [fs] and the supervisor will know 95% of the problem. In other words, I as a supervisor would know what it is that I think ought to be investigated, the students may just know that is a field of rock mechanics. In three years time, when we get to the end of it, the student-supervisors relationship is changed completely. They are then not only my equal in terms of their academic attainment, but in fact they are by definition the expert on that particular field. And then, although both the supervisor and the student have learnt an awful lot more about that particular problem, it is the student who knows 95% of it and the supervisor who knows 5%. So the roles are reversed. And so it's not appropriate, I think, to take it as a ...erm... as a high school exercise, they write me an essay, I sit, read it, give it back with a mark on. I don't do that. I'm aiming, of course, to get these guys to be able to write a PhD thesis. So when they give me a report, I will read it bring them in and debrief them, which usually involves just saying this is nonsense. This is complete and utter rubbish. You cannot produce work like this. Erm... and as I said this comes as a shock to them, but I don't think just showing there

would be a mark would actually have any relevance at all. And you can't actually give marks, you can't actually say, well it's ok, you are now consistently working at the 65% level, that means you'll be ok for your PhD. It doesn't work like that. It's an absolute thing. Is the work that you're doing of a sufficiently high standard to generate a PhD? And if it is you'll get it, and if it isn't, you won't. As simple as that.

*P

Er…so…in those oral or verbal debriefings you do, is there any reference to linguistic problems as well…or are they only technical?

*H

Erm… oh no absolutely. I mean if I find that …erm…[fs] I mean it's not only overseas students, some English students as well can have this trouble, where they consistently make…,not so much spelling mistakes these days because they're dealt with by the computer, but certainly grammatical errors are quite common, and the errors in punctuation and things like that. Erm…and so obviously I do point those things out to them as they go on. I must admit I don't have a degree in English, so I suspect I am not that fully qualified as I should be, but I do actually point these out to them, simply [fs] if I can read it and understand it and it reads well, that's fine. If I can't, well then they have to go and improve. But it is a very interesting issue because I [fs] writing a 250-page PhD thesis is like nothing that you have written before. To sustain the in-depth nature of the argument at such a high level over such a long period of time or number of pages is like nothing else. And we've never done anything like that until we actually get to write our PhD theses. So it's tough, it's tough. And I'm not sure that you could actually be fully prepared for it. I'm not so sure that [fs] …I think the only training you can have for writing a PhD thesis is writing a PhD thesis, and few people write, too. Erm…and it's probably the role of the supervisor then, who's actually gone through it, who's got the scars on their arms to show they've written a thesis, that they can then try and get that across to students. And it's just the case of ----------pointing them with a sharp stick to just keep them going until they actually get there. But it does need… it does need a very very high level of…erm… intrinsic capability in the use of English. And the college has recently increased its Test of English as a Foreign Language score … and it's been noticeable that I had students who came in on the lowest scores and students who've come in the more recent higher scores …and my job as the supervisors is made a lot easier by that. And of course the student's job as a researcher is made a lot easier. I mean they may complain to start with about having to get a far higher …erm… TOEFL score than anybody else, but the fact is that once they've got them, then they will be able to get to a much higher level in terms of their scientific endeavours.

*P

OK…I only have two more questions, if that's ok. Could you please tell me about the relationship or the effect of the relationship between students themselves in learning this trade of doing research?

*H

It's a very difficult problem. I think …erm… something that seems to me is that students seem to think that there must be a prize for the best PhD thesis or the one who does it most quickly or something like that. I've got a number of PhD students who are all working on very similar …erm…aspects of rock mechanics. And in fact, as a number of different facets to the work which actually cross between students. But they're not doing the same thing, but the student might be developing a mathematical technique, which is useful not only for him but also for his colleague as well. And it's very difficult to actually say to student, 'will you please talk together, will you please try and share your ideas?' There are no prizes for doing it all yourself. If somebody is [*2] developing methodology A because they got there first, but that somebody could do with it once it's developed, then they should hand it over; otherwise the other poor chap has got to sit down and go through exactly the same process as the first one did. And if they all start working together like that of course, well then they will all improve substantially more. The whole is greater than the sum

of the parts. It's as simple as that. But it's a very very difficult thing to do. I don't know why, but students tend ..PhD students…I think all students do it. And you can understand it why it's in the undergraduate level, but when it gets to the PhD level, it's very difficult to see why they insist on sitting and working by themselves. And they almost have to be prodded and poked to actually work as a team. …I'd like them to work as team because they can get so much out of it, but it's difficult to make them do it.
*P
Do you mean that the …the students who are [fs] the students' topics are sort of specific to themselves rather [H: Oh yeah absolutely] than being part of a bigger project?
*H
No, no, it's [fs]…I suppose they're all [fs]…this is something I've been thinking of … of thinking about myself over the last year or so, in that almost without knowing there is this …I've got this theme running through all of my research…which is the use of quite sophisticated mathematical and geometric methods. Now what the students are doing …erm…is only loosely linked to that. It's a [fs] this is a spine…and the students link into it. But along this spine of geometric and [*3] mathematical methods, they can each pick up …one or two or three points, you see. But they're not all different points, they're all doing different work. Erm…and so it's [fs] …I can't actually …I can't actually say to these guys, do you realise you're all working on part of one big project. They're not. I mean they're all working on their own projects. All of them are of equal importance as far as I'm concerned; I ain't got any favourites. But that those things to be this [*2] spine of ideas running through, which I suppose is my fundamental …line of enquiry. And if there is an overall project, it's that; but it's too nebulous to say it's an overall project.
*P
Can I ask you my last question? What do you see as the main differences between a person who holds a PhD and a person who's just started doing a PhD?
*H
That's quite easy to say, actually. I mean again unless you've actually been through it, you don't know. Well…and I think it's just in the science and engineering field. Frankly, I think {I think it can be some doping that}it doesn't mater what the subject matter is of your PhD. What your PhD will do is teach you how to solve problems that are first of all so poorly posed that it's very difficult to see what the problem is. And secondly, get a solution to the problem in such a way that it'll actually help people [fs]…it'll help with our development. And that's why I think the PhD can be loosely divided into three parts. The first part [fs] the first year is 'what is the problem?' So a student will walk in, day 1, year 1, I will sit down, talk to them, we'll come up with some mutual agreement as to what we think the research should be doing. Erm…the student then goes off and starts working. And by the time we get to the end of the first year, we will at that point have actually been able…we will actually be able to then say, 'so that's what the problem is'. We started by thinking about something, but then we actually [fs] after a year's work, actually, found out what's really stopping us understanding it is this, whatever this is ... assuming usually quite trivial in fact. Erm…but is that being able to take the…whole and very very poorly posed problem? And then, get after one year…an idea that this is what we really need to be investigating, one very very small tightly defined problem. The second year is actually getting a solution to that tightly defined problem. You can't get solution to the whole thing. I mean that's a lifetime's work. But once you've actually highlighted one very very small tightly defined problem, then you can go ahead and solve it. And so the second year is usually spent getting a solution to that problem. The third year. is then the easy year, and that's write it all up, so that somebody else can read it. Except it's the hardest, because actually sitting and writing it in a coherent fashion is very very difficult. And I think that's what the student learns. First of all how to take a poorly posed problem. Work at it until they can find what the absolute knob of the problem is, they can then, having identified it solve it. Having solved it, they can then write the methodology and findings in such a way that more people

can [*2] learn from it. And on that basis it doesn't matter what the subject matter is because those are skills that you then take with you. And I remember when I finished mine, erm...it was a wonderful feeling to realise that I could actually look at things and think, ' why does it do that?' And sit and think about it and eventually just come up with an answer, 'Oh, right, of course. it's this, this, this.' And it was a wonderful feeling to realise that I could actually do that. And that's what the PhD trains you to do.

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